

expanded options and more flexibility in realizing value for remote gas resources. He added that another possibility for further gas resource commercialization lies in the potential for reduction in conventional pipeline cost, since long large diameter pipeline transportation systems are major cost components of conventional developments that can stop otherwise attractive projects.

He went on to say that 'a major challenge for many Middle Eastern oil and gas developments is handling sour gas and that the industry more options for sour gas management.'

Cassiani concluded his address by saying that oil and gas management for the future requires ongoing investment in innovative technology, skillful and practical business management as well as critical cooperation between industry and house governments to reduce cycle time, increase recovery, lower cost and produce a straight steady grow we all want to see.

Gas: from the reservoir to the customer

During the 4-day conference period, four technical sessions were held simultaneously in four different halls adjacent to the oil and gas exhibition area. In each session, six papers were presented by the authors, which was followed by questions and answers. One of the sessions was dedicated to the issue of gas which was entitled 'gas: from the reservoir to the customer.'

Andy Dyke from BP gas & power section dealt with different aspects of gas market and technology. He said that 'currently some 25% of world primary energy demand is satisfied by gas but this component is growing disproportionately to coal and oil. Looking into the future one can now easily envisage a global economy in which natural gas has become the most important fossil fuel - the Gas Economy.

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Ultimately, as pressure for ever cleaner, lower carbon energy sources increases further the era of renewable and hydrogen may evolve, although these require significant further technology development before they are a true economic option on a global scale. During the first part of this millennium, the Gas Economy will bridge the gap providing a clean, cost effective energy source.'

Elaborating on the ongoing competition in gas markets in the world, he said that his company has been a vanguard of meeting that competition head on, adding that, for example, it has been instrumental in the creation of a traded spot market in gas for the UK and continental markets leading to the emergence of a European spot market.

On LNG projects he explained about the reduction in costs of LNG production and transport in the recent years such as historical benchmark costs of \$ 250 m which have fallen to as low as \$ 170 m per LNG tanker, largely through competition in the marketplace, while further shipping cost reductions will be achieved by supply optimisation.

He also said that cost reduction have also been achieved in LNG import re-gasification plant and further innovation may result in lower costs and smaller-scale plant (i.e. less than 1mte/yr) in the future.

He added that this will extend the customer offer to customers who previously were unable to aggregate sufficient LNG demand (typically in excess of 3mte/yr) to justify construction of expensive receiving facilities.

Andy Dyke said BP believes that there is a further achievable reduction in LNG cost of supply in the next few years of 25%, sufficient to allow LNG to compete with pipeline gas in many markets.

He pointed to India and China as two important potential gas markets and said in India BP is promoting new technologies to bring the benefits of environmentally friendly fuels to customers who do not have the option to buy natural gas via LNG or pipeline. He then referred to DME as a potential solution to a new, ultra-clean fuel for gas turbines for these customers. He said the potential of DME is not. However, restricted to power use, adding that DME's handling characteristics are such that it can be bottled like LPG for domestic applications and it is thus an ideal substitute and could be offered to the market without the price volatility of LPG itself. He went on to say, 'we believe that the first DME production plant has a high probability of being located in the Middle East. The process will need to utilise low cost sources of natural gas, and given their availability here coupled with close geographic proximity to Southern Indian customers, this could be a favoured location under the right investment conditions.

On the BP activities on the supply side, he said that the company along with NIOC and Reliance Industries of India have recently announced the signing of a Memorandum of Association (MOA) to undertake a \$10 m feasibility study with a view to the development of an LNG project in southern Iran, targeting export to India, as well as other markets in Asia and Europe.

The Bahrain oil conference and show ended on 20 March 2001. The next meeting entitled MEOS 2003 will be held in February/March 2003.

kind of innovation and creativity is one of the main reasons of the existence of SPE. He added that the upstream world is exceedingly diverse, but technology knows no bounds.

Innovation and technology, key elements in upgrading upstream industry

Stephen Cassiani, President of the Upstream Research Company of Exxon Mobil, was another keynote speaker at the opening ceremony who focused on innovation and technology.

He referred to the continued challenge of mitigating the volatility that the oil industry must deal with while providing a steady stream of growth that is valued by investors and governments alike. He pointed to the application of innovative technology as a powerful tool for achieving continuous performance improvement, adding that technology alone would not produce the desired results, innovative, visionary management executed by skilled and experienced staff is clearly critical to continued strong long-term business performance.

He then dwelt on certain technology innovations that have enabled the oil industry prosper and grow the last century. He cited, among other examples, natural gas technology and LNG tanker development providing a viable critical mechanism for delivering remote gas to markets. He added that a good example of the industry's creative and innovative capacity affecting the Middle East today is in LNG production. He remarked that 1960's technology restricted the industry to LNG trains to a maximum production capacity in the range of roughly half a million tonnes per annum, while gas turbine, compressor and heat exchanger technology improvements have made it possible to build trains of three million tonnes and the RasGas train 3 in Qatar targeted for 2004 start-up will have a capacity in excess of four million tonnes per annum. Increasing the LNG train capacity,

he said, has been a major contributor to a roughly 60 percent reduction in LNG unit cost since the late 1970's.

On the key technology needs and anticipated improvements that could produce enhanced values in the Middle East, Cassiani said cost effective, high performing oil and gas development depend on a very clear understanding of the rock properties, geometry and continuity of the reservoir and associated hydrocarbon system. He went on to say 'in order to enhance reservoir performance, we must continue to improve our capabilities for understanding the fundamental nature of specific reservoirs and



more accurately characterize them early in the development process."

Cassiani also said, in addition to a thorough understanding of the physical architecture, it is essential that we understand the type, composition and volume of the fluids present, how they are distributed and what production pass and impediments exist for extracting hydrocarbons from the reservoirs. He added, 'we need to know early, which means that we have typically limited data, and we need to know with great clarity. This knowledge is critical to all the important decisions we will make in developing these resources. We need to move from qualitative evaluation of

seismic data to evaluations that produce accurate qualitative determinations leading to fewer and better placed wells. The solution involves better seismic data collection, processing and interpretation. Improved seismic acquisition techniques give us higher quality, and higher resolution data to work with.'

In part of his speech, Cassiani said natural gas will be increasingly important in meeting future world energy demand. In fact gas demand for the foreseeable future is expected to rise at a rate in excess of three percent per year, we can expect especially rapid growth in demand for the Middle

Eastern gas both for domestic use and for export. He also said that LNG technology has greatly extended our capability to supply natural gas to remote markets, but he believes that additional improvements can be achieved in gas technology in future, for example current delivery systems require extensive onshore terminals usually in highly developed and populated areas where land access is difficult, thus better approaches are needed to allow improved LNG access to markets in highly developed areas.

Also on the gas issue, he said that a number of promising technologies are emerging for converting gas to high valued products such as lubricants, this will result in

courses held on the day following the close of the conference covering Field Development Economics and Hydraulic Fracturing/Pressure Analysis.

Four myths about oil and gas industry

In the opening session of the conference, John Calligan, one the senior officials of SPE, addressed the audience. On the theme of the conference he termed it as a very suitable for MEOS 2001, the first event which is taking place in the new millenium and he focused on how to harness the creativity to create complex technical and business issues and solve. He said, 'the last conference here in Bahrain when the industry was in a very substantial downturn and fortunately the industry has weathered that storm and we can learn from the past two years to give us a sound foundation for the future.

He referred to the holding of the conference as an example of the success, the resilience and the vitality of the industry.' He then elaborated on certain subjects which he called as myths about the oil and gas industry. He said, 'the first myth is that we are a sunset industry with perhaps a great past but a declining future.' He went on to say that the end of the hydrocarbons has been regularly forecast in the past, but somehow it just doesn't happen. At the moment the oil and gas count for over 60 percent of the world energy and this proportion is increasing and this energy is absolutely vital for our civilization to prosper. And some may ask if it is sustainable. In spite of continued and increasing production, the remaining oil and gas reserves in the world, estimated by the US Geological Survey and other organizations, have been continuously increasing.

On the alternatives of the oil and gas, he said that coal is abundant, but it does create atmospheric emissions such as smog, which cannot be ignored in an environment conscious world. On the hydroelectric energy

Gas demand for the foreseeable future is expected to rise at a rate in excess of three percent per year

he said that most of potential sites have already been used and generating new sites have significant environmental impacts on the countryside. He went on to say that there is a lot of public resistance exists for safety reasons particularly after the Chernobyl catastrophe, concluding that it is difficult to see that many major campaigns to build new nuclear power stations are going to be acceptable to the public in many places. Pointing to the renewable energies as an alternative to oil and gas, he said that while the public loves the idea, and no doubt the renewable' time will come and they will compete with oil and gas, but it takes time, at least some twenty years.

Six billion people in the world today, mostly in developing countries, are looking for higher quality of life and standards of living, and this means more energy and this is largely met by oil and gas consumption. He concluded that the oil and gas industry is not a sunset industry and there is a bright future for the industry.

He said the second myth is that technology is becoming less important. Dismissing the idea he said one should look how technology has changed the business over the last generation, and its tremendous impacts on the reserves, on increasing productivity and reducing costs. He said, " I know some areas where the ultimate

recovery for the same fields has been continually increasing by one percent of the oil in place every year from technology. I know the places where technology has made billions of barrels of previously uneconomic oil, economic.'

He went on to say that the third myth is that the industry has not enough skilled people. He admitted that it is the case mainly due to volatility of the oil prices which directly affects the investments in upstream, but he said that inspire the increase in production, there are now fewer engineers working in the upstream that used to be, but a very important factor is new technology which has made engineers much more productive and therefore there is no need for many engineers now to manage a given field. He called it a trend that is going to continue as technology continues to advance.

He remarked that the fourth myth about the industry is that damaging oil price volatility will be reduced. Praising OPEC's efforts to stabilize the market by sticking to its price band mechanism, he said however that he is not sure that the stability in oil prices would realize because the whole oil supply and demand dynamics is a very complex system. He said trying to control the oil price is like trying to drive a car at a constant speed with spongy brakes, and a sticky accelerator, and a speedometer that doesn't work on a bumpy road. He noted that there is always a tendency to overreact to oil price changes, in a low price world, investment is drastically cut back, people are laid off. He said, 'although we yearn for stability and volatility can indeed be very painful, it is a fact that it is not all bad. It stimulates innovation, because it is uncertainty, which can bring resilience and keep the industry on its feet.

Calligan said, "advanced techniques developed in the good times can be refined to make more cost-effective in harder times, and I find it amazing what creative engineers can do in a difficult environment."

He went on to say that stimulating this

Bahrain oil show and conference

Homayoun Mobaraki



12th Middle East Oil Show & Conference 'MEOS 2001' was held within 17-20 March 2001 in the international exhibition of the Persian Gulf state of Bahrain.

The gathering which was held under the patronage of Bahrain's Prime Minister Shaikh Khalifa bin Sulman Al Khalifa, was inaugurated by him on Tuesday morning 17 March and was followed by a tour of the exhibition by dignitaries present in the ceremony.

MEOS 2001, the 12th in the series, had attracted representation from more than 250 companies from 20 countries, filling the Bahrain International Exhibition Center to capacity.

The Society of Petroleum Engineers (SPE) as the scientific sponsor of the conference and the Conference Committee had produced the conference agenda with theme: Oil and Gas for an Uncertain Future; integration, Innovation and Technology.

The committee had accepted over 130 technical papers to be presented by leading

experts in their fields from all over the world, covering all areas of upstream oil and gas operations. MEOS 2001 also had the innovation of poster sessions, as a way of integrating the exhibition with the conference.

President of the Society of Petroleum Engineers Bruce Bernard in a message to the gathering said since its inception in 1979 the SPE Middle East Oil Show & Conference (MEOS) has played a significant role in the development and transfer of oil and gas technology in the Middle East, the world's largest energy producing region, and its importance grows with each year.

He also remarked that MEOS 2001 features both an outstanding and extensive exhibition of hardware and services, together with a comprehensive technical conference program which ensures a valuable exchange of oil and gas field knowledge and experience among managing, operating and supplying companies.

Attended as it is, by experts from nearly every oil-producing state in the region,

including engineers, geoscientists, managers and technicians, MEOS provides a vital platform where peers can learn about and share technology and best practices to be used in resolving the unique challenges of managing and exploiting the most significant reserves of hydrocarbons in the world, said the 2001 SPE president. The Program committee had selected as its conference theme: Optimising Oil and Gas for an Uncertain Future: Integration, Innovation and Technology. Bernard said, "this theme was wholly appropriate for MEOS 2001, taking place for the first time in the new millennium, and will help us to focus on how we harness innovation, integration, and technology to solve the complex technical and business issues.

In highlighting the uncertainties of the future in our industry, he said, the theme places even greater focus on the benefits of SPE membership to professionals, both in their personal and technological development, adding that the Society considers MEOS to be one of the finest examples of how it achieves its mission of collecting and disseminating technical information.

Also the Chairman of the Technical Program Committee of the 12th SPE Middle East Oil Show & Conference, Saad Turaiki, who is General Manager of Petroleum Engineering with Saudi Aramco, in his message to the gathering said, " We have recognised that our industry in the Middle East must continue its drive towards continual improvement and increasing efficiency through a masterful combination of new technologies, multi-disciplinary approaches and 'out-of-box' thinking. This is reflected in the theme we have chosen for the conference and we have encouraged authors to focus their papers on the theme's strap-line: integration, innovation and technology.

He also referred to the poster sessions during the first three days of the conference as an idea put forth by the Conference Program Committee and also two SPE short