

gas-hydrates with a view to exploring and exploiting this natural resource from the India offshore

Dr P S Goel, Secretary, Ministry of Earth Sciences inaugurated and chaired the inaugural function Prof Harsh Gupta, Former Secretary, Department of Ocean Development and Raja Ramanna Fellow, NGRI delivered the keynote address and was the Chief Guest Dr N Satya Nandan, Secretary General, International Seabed

Authority (ISBA) was the Guest of Honor Dr S Kathirolu, Director, NIOT welcome the dignitaries and delegates and Dr VP Dimiri, Director, NGRI gave an overview of the seminar

*Gas Hydrate Project*  
NGRI  
Hyderabad

KALACHAND SAIN

## INTERNATIONAL WORKSHOP ON R&D CHALLENGES IN CARBON CAPTURE AND STORAGE TECHNOLOGY FOR SUSTAINABLE ENERGY FUTURE

As an attempt towards India's Carbon abatement effort, an International Workshop on R&D Challenges in Carbon Capture & Storage Technology for Sustainable Energy Future (IWCCS-07) was organized jointly by the National Geophysical Research Institute (NGRI), Hyderabad and the Department of Science and Technology (DST), New Delhi on January 12-13, 2007 at NGRI, Hyderabad. The Workshop was inaugurated by Hon'ble Secretary, Ministry of Power, Shri R V Shahi. Dr B Kumar, Convener and Organizing Secretary, IWCCS-07 mentioned that the two-day deliberations would help us in meeting the R&D challenges in CCS Technology for Sustainable Energy future. Dr VP Dimiri, Director, NGRI & Chairperson of IWCCS-07 welcoming the invited dignitaries, speakers and the delegates to the workshop said that India should soon adopt the CCS technology for tackling the adverse climate effects and also for enhanced oil recovery to meet the growing energy demands. The Welcome address was followed by the addresses of Dr Malti Goel, Co-Chair of IWCCS-07 and 'Senior Scientist' DST, Dr Pete McGrail, Chief Scientist, Battelle Pacific Northwest National Laboratory, USA, Dr Deborah Petterson, First Secretary, British High Commission and Dr R R Sonde, Executive Director, National Thermal Power Corporation (NTPC).

Prof Harsh K Gupta, Raja Ramanna Fellow, NGRI and Guest of Honour for IWCCS-07 released the abstract volume and address the Workshop participants. He talked about India's energy demand, energy security and CO<sub>2</sub> mitigation. Dr Gupta also mentioned about the shrinking of glaciers at Antarctica as one of the detrimental effects of the climate change and appreciated the joint efforts of NGRI and DST for providing a platform for international collaboration on CCS technology.

In the inaugural address, Hon'ble Secretary, Ministry

of Power, Shri R V Shahi spoke about India's goal of sustained economic growth at 8 to 9% and to meet the future energy demands, he focused attention on harnessing of the hydroelectric potential which is estimated to be of about 1,50,000 MW. He laid stress on generation of international consensus for the same. He also highlighted India's position on climate change broadly by following the United Nations Convention Treaty on Climate Change and Kyoto Protocol.

The Workshop included six invited talks, 24 oral presentations and three presentations in special UK session. The six invited talks by Drs Mrs Malti Goel (DST, New Delhi), R R Sonde (NTPC, Noida), Pete McGrail, (PNNL, USA), VP Dimiri, (NGRI, Hyderabad), Dag Nummedal (Colorado School of Mines, USA) and Christian Fouillac (BRGM, France) mainly focused on R&D of CCS technologies in India, USA and France.

The session on Carbon Capture Research in India had the presentations by Drs Sadhana Rayulu (NEERI, Nagpur), Asha Masohan & A N Goswami (IIP, Dehradun) and G Parthasarathy (NGRI, Hyderabad). The Special Session on Sharing Experience with experts from UK on Carbon Capture comprised of presentations by Drs Tim Dixon (DTI, UK), Jon Gibbins (Imperial College, London) and Sam Holloway (BGS, UK).

The technical session on Geological Storage Technology for CO<sub>2</sub> comprised of an invited talk by Prof K V Subba Rao (University of Hyderabad) and presentations by Drs B Kumar & P S R Prasad (NGRI, Hyderabad), Anil Bhandari (GHS, New Delhi), A Mondal (GSI, Kolkata) and Ms Laura Chiaramonte (Stanford University, USA). The session on Geological Storage Technology for CO<sub>2</sub> (Oil & Gas) had presentations by Mr Kuldeep Chandra (KDMIPE, Dehradun), M Suresh Kumar (ONGC, Ahmedabad) and Drs A K Singh & V A Mendhe (CMRI,

Dhanbad) and Jeremy Boak's (Colorado School of Mines, USA)

In the session on CO<sub>2</sub> Injection & Monitoring and Bio-Sequestration, papers were presented by Drs Sandeep Sharma (CRCGGT, Australia), M Sengul (Schlumberger Carbon Services, UAE) and Ms Devleena Mani (NGRI, Hyderabad) The concluding session on International Initiatives, Programs and Collaborations had papers presented by Drs Iain Wright (BP, UK) and Christian Fouillac (BRGM, France), Mr Mudit Naram (MIT, USA) and Vilas Pharande (NCL, Pune)

#### Recommendations

The following recommendations were put forward at the Valedictory Session which was Chaired by Dr VP Dimri, Director, NGRI and Co-Chaired by Dr Malti Goel, Scientist-G & Adviser, DST

- Carbon capture and storage research offers an opportunity to mitigate global concerns about climate change and sustainable future
- Suggested expansion of support to research and CO<sub>2</sub> infrastructure from DST and other concerned sectors of economy, under the National Programme on CO<sub>2</sub> Sequestration Research
- Establish Centre for Advanced Studies in India for CCS technology to lead R&D projects on Carbon Capture, Geological Sequestration of CO<sub>2</sub>, Monitoring,

Modeling & Simulation studies and Clean Energy Development

- Organize a special session on India's initiatives on Carbon Capture and Storage R & D during 2008 at an international event
- Give more thrust to basalt pilot study using sub-basalt imaging techniques and establish baseline for concentration of CO<sub>2</sub> in atmosphere and soil and dissolved inorganic carbon (DIC) in shallow aquifer
- Facilitate inter and intra-networking between national and international projects on CCS technology
- Indian CO<sub>2</sub> Sequestration Applied Research Network to have institutional members and hold periodic meetings to develop an activity profile and framework for support
- Develop new knowledge partners with multi-disciplinary and multi-stage collaborations for sustainable energy future

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#### REMAINS OF MICROSCOPIC DIAMONDS

The 'News' that a group of scientists of the American Geophysical Union have reported that they have found a layer of microscopic diamonds from 26 different sites in Europe, Canada, and America will be read with interest by our readers. The diamonds are believed to be the remains of a great carbon rich comet which crashed on earth 13,900 years ago – *The Observer*, 20<sup>th</sup> May, 2007, <http://Observer.guardian.co.uk/World/Story/0,2083758,00.html>

#### CAUSE OF EARTHQUAKES IN HIMALAYA DURING WINTER

More earthquakes are reported in the Himalaya in the winter. It is conjectured that heavy rainfall in the summer monsoon weighs down northern India with water and fill underground aquifers changing the stress pattern in the surrounding rocks and fault system – *Nature*, Research Highlights, 17<sup>th</sup> May, 2007, p 235

#### LANDSLIDE STUDIES

Geological Society of France has brought out an informative issue on 'Landslide Process Monitoring' (*Bull Geol Soc France*, 2007, 178, No 2) The book is available for consultation in the library of the Society