



Welcome to this conference issue of GEOHORIZONS!

On behalf of the SPG Editorial Committee, I am delighted to welcome you at SPG's 14th Biennial International Conference, taking place at Kochi from 3rd to 5th November 2023. The theme for the conference, "*New Age Geosciences: A Fulcrum for Energy Trilemma*", is very relevant in view of India's commitment to reduce dependence on fossil fuels and strive towards greener solutions.

In this issue of GEOHORIZONS, we have published an interview with Ms. Sushma Rawat, Director (Exploration), ONGC, who became the first lady to occupy the country's top exploration position, within the Energy Maharatna. In our regular Memoir column, we have a memoir from a stalwart of the Indian oil industry, and a well-respected individual. He is none other than Mr. Niranjana C. Nanda, who retired from ONGC in 1996, but is still very active with his geoscience consulting and teaching assignments.

In continuation of our regular column called 'Expert Answers', in this issue we have chosen two questions to be answered. The first chosen question is '*How have we addressed the problem of improving resolution of the seismic data over the last three decades, since 3D seismic data started getting adopted as a routine by oil companies?*' The experts answering this question are Hongliu Zeng, a senior research scientist at the Bureau of Economic Geology (BEG), Jackson School of Geosciences, The University of Texas at Austin, and Rui Zhang, who is Associate Professor in geophysics, holding John E. and Joretta A. Chance Endowed Professorship, at the School of Geosciences, University of Louisiana at Lafayette, USA. The second question is '*How is it possible to meet the challenge of distinguishing 'fizz gas' from 'commercial gas' sand units in the subsurface using seismic and borehole data?*' The expert answering this question is Reinaldo Michelena, Director, SeisPetro Geoconsulting and SeisPetro Geosoftware and is based in Denver, Colorado, USA.

In his conference-theme article entitled '*Energy Trilemma and the hydrocarbon industry: the Indian scenario*', Koushik elaborates on the conference theme explaining how the hydrocarbon industry can navigate the complexities of the energy trilemma and secure its place in the energy landscape of tomorrow.

Krishnan and Shastri in their paper entitled '*Oil and gas are here to stay; exploration is indispensable*', make the case that even though the world is looking at decarbonization as a solution to environmental challenges, the progress made so far is slow and it is not expected to change drastically over the next decade and beyond. The authors argue that as far as energy mix for India is concerned, hydrocarbons will be the mainstay of energy in the years to come, and the country should continue its exploratory efforts more aggressively than in the past.

2023 is a landmark year for Indian geophysics as it completes 100 years since the first geophysical survey was conducted on Indian soil. Therefore, very appropriately, the theme for this conference issue of GEOHORIZONS has been chosen as '*100 years of geophysics in India*'. Accordingly, a collection of papers around this theme have been included in this issue.

There are three papers on the GEOHORIZONS conference issue theme, which discuss the historical evolution of the application of geophysical methods in India for the exploration of oil and gas in India.

In this 'centenary year of geophysics', and true to the title of their paper '*Development of geophysics applications for oil and gas exploration in India – a historical ONGC perspective*', Chopra et al. discuss the historical applications of surface geophysics to oil and gas exploration throughout India, more from an ONGC perspective.

Kumar et al. in their paper entitled '*100 years of seismic prospecting: the geophysical journey of Oil India Limited*', share the seismic prospecting history of OIL which initially focused on the northeastern regions but later spread out in some other areas onshore and offshore.


Gahalaut, in his paper entitled '*Developments in past hundred years in India in the fields of seismology, tectonics and geodynamics*' brings out the developments in the past 100 years in the field of seismology, tectonics and geodynamics related to the Indian subcontinent. The author says that the conceptualisation of the plate tectonic theory improved our understanding of the earth's complex processes, and efforts have been made to assess the impact of hazards and to mitigate the risk.

Amongst the technical articles in this issue of GEOHORIZONS, Prasad et al. in their paper entitled '*Seismic inversion using laterally varying wavelets for retrieving acoustic properties in gas chimney zone: A case study from North Tapti gas field, Western Offshore Basin, India*' discuss the application of poststack impedance inversion using laterally varying wavelets in a gas chimney affected area and restore the realistic elastic properties which helped demarcate the envisaged boundary of the gas-affected area.

Chopra et al. in their paper entitled '*Bandwidth extension of seismic data and its impact on seismic attribute computation*' demonstrate that bandwidth extension of input seismic data not only improves the resolution of the data, but also the seismic facies classification computed using unsupervised machine learning tools such as self-organizing mapping (SOM) and generative topographic mapping (GTM). The bandwidth extended seismic data depict superior definition of the facies clusters as well as colour variations within them.

In the regular tutorial column, we have published a tutorial on '*A rendezvous with controlled source electromagnetics (CSEM)*', Ritesh Mohan Joshi talks about this method based on entirely different physics that what we are used to talking about for the seismic, gravity and magnetic methods for geophysical prospecting. CSEM usage has a wider spectrum, anywhere from reconnaissance to 4D seismic to new kid in the block viz. CO₂ monitoring.

Finally, in the SPG news column, we report on the activities that the different SPG Chapters have been engaged over the last little while.

We thank the authors for their valuable contributions, and hope the readers find the articles both informative and interesting. Please do let us know what you think of this edition of our journal. 

- Satinder Chopra, Chief Editor