

SPG- Jorhat Chapter Organised Workshop on “Non-Conventional Methods of Exploration - In Search of Hydrocarbons, There is no Finish Line”

Society of Petroleum Geophysicists, Jorhat Chapter organized Annual Technical Seminar 2015, a day long workshop with the theme “*Non-Conventional Methods of Exploration - In Search of Hydrocarbons, There is no Finish Line*” at B.R. Ambedkar Club, ONGC, Jorhat on 19th September, 2015.

Among global hydrocarbon provinces, Fold Thrust Belts (FTB) are the most complex geological systems and technically challenging environments for exploration. FTBs are estimated to contain 14% of known and undiscovered global recoverable hydrocarbons. Assam Arakan Fold Belt of A&AA Basin, in spite of huge prospectivity, greater part remains poorly explored due to harsh logistics and complex subsurface geology and justifies further exploration.

On this background, SPG-Jorhat Chapter organized this workshop to enlighten geo-scientific community of Jorhat, with the experts of different non-conventional methods like Prof. Akis Tselentis (Land Tech-Geophysics) in Passive Seismic Tomography from Greece; Shri G. K. Batta (OIL Ltd.) for Fluid Pressure Wave from India; Dr. Lee Bell (Geokinetics) in Broadband seismic from Houston, USA; Shri James Dirstein (Pinemont Technologies) in Airborne Passive Electromagnetics from Perth, Australia; Shri David Moore (CGG) in Airborne Gravity Gradiometry from Perth, Australia, Shri Joseph Zacharia (Schlumberger) in Advanced Well Logging Tools from India and Shri S. K. Pegu (INBIGS, ONGC) in Geo-microbial Survey. More than hundred members participated in the seminar.

The idea to organize workshop on theme “non-conventional methods” and to have lectures by world renowned experts was first floated by Shri C M Jain, President, SPG-Jorhat Chapter. This idea was successfully manifested into a workshop by team of young geoscientists.

The day-long work shop comprised of seven lectures spread over three technical sessions covering seven renowned non-conventional methods for Hydrocarbon exploration by eminent geoscientists. The participants, especially young geoscientists, were very keen and interactive throughout the work shop. Evening was celebrated by a spectacular cultural programme followed by interactive dinner.

Registration for the program started with the lighting of the lamp by the Shri C. Mahapatra, ED-Basin Manger, Patron of SPG-Jorhat Chapter, Shri C.M. Jain, President, SPG-Jorhat Chapter; Shri S K Baasha, President, SPG-Duliajan Chapter, Shri F Dotiwala, President, APG-Jorhat Chapter along with experts from different service organisations.

Shri C M Jain welcomed the distinguished guests & speakers. In his welcome speech, he highlighted the role of the SPG in supporting industry by creating enabling environment for knowledge sharing. He elucidated the various complexities and risks pertaining to Fold Belt exploration. Shri Jain stating the fact that Mesozoic rocks contribute to nearly half of the oil and gas reserves world over, stressed on looking at the hydrocarbon potential of Mesozoic sediments in India too. He mentioned that new technology & new ideas only can potentially mitigate the risks of present day hydrocarbon exploration. Concluding his welcome speech, Shri Jain emphasized that technology alone does not solve the problems, it is the great ability and talent of geoscientists along with technology will help in mitigating risks.

Shri S K Baasha, President, SPG-Duliajan Chapter, in his key note address, showed concern on energy security of India. He explained the ever increasing demand and invokes geoscientists and engineers to extract to the last drop of oil. He mentioned that today's thrust is new oil from new fields,



Inauguration session and Lamp Lighting Ceremony



Key note Address by Shri C. Mahapatra, Patron, SPG-Jorhat Chapter & Shri C. M. Jain, President SPG-Jorhat Chapter

new oil from old fields and only possible by new ideas and new technology.

In his key note address, Shri F Dotiwala, Block Manager-AAFB and President APG-Jorhat Chapter, expressed his concerns in Assam Arakan Fold Belt exploration is chasing reservoir facies and reconstruction of paleo depositional environments vis-à-vis structuration. He concluded his address with a question that “Are there solutions for the concerns in Fold Belt exploration in non-conventional methods?”

Shri C Mahapatra, ED-Basin Manager and Patron SPG-Jorhat Chapter, started his key note address with famous quote of geoscience “ Present is the Key to the Past” and he continued that “Present is the Seed to the Future”. He informed the house that the first discovery of ONGC, Nahorkatiya, is based on the gravity data i.e. non-seismic data. From there, non-conventional methods keep on supporting seismic in de-risking the exploration. He expressed the dichotomy i.e. India is roaring with tremendous GDP rate, while the world is in downtrend and main lubricant for India’s growth is Oil & Gas. Difficult times as oil price is falling, however, he emphasized that it is the right time for intellectual investment. Appreciating the efforts of SPG and aptly chosen theme of non-conventional methods, he stressed upon the need of



improvement on “Return on Knowledge & Technology”.

The first lecture session witnessed delivering of two innovative technologies that invoked immense interest. The first one was by **Prof. Akis Tselentis (LandTech-Geophysics) on “Passive Seismic Tomography”**. The method involves listening to the earth passively over time and deriving structural and lithologic information from the collected P, S & Vp/Vs data. This technology works in any complex geological settings and sometimes helps in direct detection of hydrocarbons. It was followed by another enlightening lecture by a young geoscientist from OIL Ltd. **Shri G. K. Batta on “Hydrocarbon Fluid Pressure Wave”**. Fluid pressure wave is a wave generated by pore-fluid elastic strata under abnormal pressure. The wave is characterised by low velocity, low frequency and high amplitude. During the presentation, Physics and methodology involved in this technology was explained in detail by G K Batta with various live examples and road ahead. Both the lectures were quite interesting and deeply appreciated by the participants.

The Second lecture session comprised of three renowned & new non-conventional technologies. **Broadband seismic technology** by **Dr. Bell** from Geokinetics Singapore Pvt. Ltd. was beautifully explained. Broadband seismic is about the extended band width, which will bring improved



Key note Address by Shri F. Dotiwala, President, APG-Jorhat Chapter & Shri. S. K. Baasha, President SPG-Duliajan Chapter





Lectures by Experts of Different Non-Conventional Methods

interpretability and inversion accuracy. Dr Bell took the opportunity to introduce non-explosive seismic source “On Seis” based upon accelerated weight dropping method, which is environmental friendly and cost effective. Best part of “OnSeis” is its accessibility to difficult areas. **Shri James Dirstein** from Pinemont Technologies, Australia, brought new technology, “**Airborne Passive Electromagnetics**” for hydrocarbon exploration. This technology is based on the theory that interaction of naturally occurring transient pulses with elements of REDOX cells abundantly present in and around hydrocarbon reservoirs. Numerous case studies were presented to understand the applicability and success of this technology. **Shri David Moore** from **CGG** presented an overview of new technology “**Airborne Gravity Gradiometry**”, based on the spatial rate of change of gravitational acceleration. Since, Gravity Gradiometry measures rate of change of three components in three directions, subtle lateral subsurface density changes can be studied and attribute them to the lithology. Various examples showing the advantages of integrating Gravity Gradiometry results to the seismic were shown and discussed. All three lectures were interactive, thought

provoking and attracted the attention of participants, especially younger lot.

Third lecture session was all about advanced well logging tools for hydrocarbon exploration and Geo-microbial techniques for hydrocarbon prospecting. The first one “Advanced well logging tools for hydrocarbon exploration” was delivered by **Shri Joseph Zacharia** from **Schlumberger**. The presentation cover **advanced logging technologies** that helped in tackling challenges in a scientific and efficient manner. **Shri S. K. Pegu** from **INBIGS-ONGC**, Jorhat presented **Geo-microbial method**, a non-conventional surface exploration technique, based on enumeration of specific microbials that thrive on the seepage of light gaseous hydrocarbons from subsurface. The technique is simple, independent, economic and quick for exploring virgin areas. Mr. Pegu narrated the technology with various in-house case studies. New dimensions of logging tools and chemistry invoked interest in the participants. Session was quite interactive.

It was perceived by the audiences that the knowledge so imparted through deliberations and presentations was of



Interaction during Lecture Sessions



Dr. S. Siva Prabha & Shri Anupam Hazra Compering the Sessions; Vote of Thanks by Shri K. Muthaiah

greater importance and can be planned implementing in some of the tough areas where conventional methods could not be applied.

Finally, the meeting was concluded with the vote of thanks by Shri K.Muthaiah, Secretary, SPG India, Jorhat Chapter.