



'The country needs young minds to play a vital role'

- An interview with Dr. Manas Kumar Sharma*, Dir (E and D), OIL



Dr. Manas Kumar Sharma serves as Director (Exploration & Development) of Oil India Limited (OIL), India's second largest national exploration and production company. Prior to taking over this position, Dr. Sharma was serving OIL as Executive Director (Basin Manager-Shelf), where he was involved in various E and P activities within the operational areas in Assam and Arunachal Pradesh of OIL. He holds M. Tech. and Ph.D. degrees in applied geology from Dibrugarh University in Assam. He is a skilled geoscientist and operational manager and carries with him more than 30 years of experience in the oil and gas industry. He has firsthand knowledge and experience in the subsurface and surface domain, both in the working as well as in the senior management level.

Dr. Sharma has conceptualized action plan for various exploration activities leading to identification of prospects for continued hydrocarbon exploration, appraisal of discoveries as well as formulation of revitalization plan for existing brown fields within operational areas in Assam and Arunachal Pradesh. He is also instrumental in establishing industry-academia collaboration with universities in northeast India, which has helped in better understanding of the Assam & Assam-Arakan Basin for carrying out extensive exploration activities by OIL in the northeast.

On requesting for an interview, due to Dr. Sharma's busy schedule, we had to wait for some time till we managed to get it. Given below are excerpts from the interview.

- Satinder Chopra

Dr. Sharma, I am sure our readers would like to get to know you better, so tell us about yourself, i.e., your educational background and your work experience.

I have pursued B.Sc. (Hons) in Geology from Gauhati University and subsequently M.Tech. and Ph.D. degrees in applied geology from Dibrugarh University in Assam.

My education has provided me strong background in understanding the surface and sub-surface domains of the hydrocarbon business.

Over the years, I have tried conceptualizing action plans for various exploration activities leading to identification of prospects, appraisal of discoveries, formulation of

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development as well as revitalization plan for all fields through a structured geoscientific approach. I am happy that the studies that I have been part of have led to the successful discovery and development of major fields of OIL.

OIL has come a long way since the discovery of crude oil in Digboi, Assam in 1889, and has emerged as an integrated upstream petroleum company. Could you tell us for the benefit of our readers, the landmarks in this historical journey, how OIL was able to overcome the challenges that may have come along the way, and what are its strategic strengths now?

Since its incorporation as a JV company in 1959 followed by becoming a wholly owned Government of India (GoI) undertaking in 1981, the journey of OIL has been exciting and enriching while also successfully mitigating challenges that have been faced as an upstream E&P player. Today, OIL has gained valuable experience of more than six decades in hydrocarbon exploration, production, and transportation. The company launched its Initial Public Offering (IPO) in 2009 and Equity shares got listed on National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) that year. OIL was awarded

'Navratna' status in 2010 and more recently as the youngest "Maharatna" company in the country.

We entered into the renewable sector through commissioning of 13.6 MW of wind power project in 2012 in Rajasthan followed by two other 38 MW and 16 MW wind power projects in Madhya Pradesh and Gujarat respectively in 2015. A 9 MW solar energy power project was also set up in Rajasthan in 2016. Under HELP (Hydrocarbon Exploration and Licensing Policy) regime, Open Acreage Licensing Policy (OALP) and DSF (Discovered Small Fields) bidding rounds, OIL has been awarded 30 blocks including three offshore blocks in Andaman and Kerala Konkan. This is in addition to the nomination blocks in Assam, Arunachal and Rajasthan from where almost all of our current production is being met. The company also diversified into CGD (City Gas Distribution) in 2018, by acquiring a majority stake in NRL (Numaligarh Refinery Limited) refinery in 2021 and setup India's first green hydrogen project in 2022.

Again, for those readers not so familiar with OIL activities, could you share with us the areas where OIL is focusing its exploration and development activities, both domestic and international? How profitable has been OIL's overseas investment?



(Speaking on the future of exploration and development activities in Oil India during his keynote address at Oil India's internal Exploration & Development Conference that took place in January 2024 at Kolkata, India.)

OIL takes pride in the fact that despite operating for such a long time in Assam Shelf Basin more particularly in the Upper Assam Shelf part with matured fields, the company has been able to sustain production levels through near field exploration, concerted development and rigorous reservoir management practices. Under nomination regime, OIL has 25 PMLs (Petroleum Mining Lease) covering about 5000 sq.km. in Assam, Arunachal Pradesh, and Rajasthan where all our production is centered.

Having said that, it is also a top priority for us to explore potential areas in other sedimentary basins for meeting our long-term production targets. Therefore, taking leverage of HELP and DSF regimes, we have managed to increase our domestic footprint in the country. Under OALP bidding rounds I to VIII, OIL has so far acquired 30 blocks covering more than 50,000 sq.km in different sedimentary basins of India. This includes 27 onshore blocks in the northeast, Odisha and Rajasthan and 3 offshore blocks in Andaman and Kerala Konkan. As we proceed with our exploration ventures which have their own inherent risks and uncertainties, our future acreage acquisition plans are in line with the philosophy of keeping a risk weighted balance across Category-I, II & III sedimentary basins. OIL is also carrying out operations

in a big way in the north bank of river Brahmaputra where historically exploration activities have been very limited so far. Drilling in the OALP blocks by OIL has already started in Category I basins in Assam Shelf and Rajasthan Basins and Category II Mahanadi Basin in Odisha. We have also acquired 3 blocks under DSF bidding rounds in Tripura, Rajasthan and KG shallow offshore.

As far as overseas assets are concerned, our exploration and production portfolio is spread over seven countries in Libya, Gabon, Nigeria, Venezuela, Mozambique, Bangladesh and Russia, comprising 10 projects.

You have a challenging job in leading the OIL efforts at identification of prospects for hydrocarbon exploration, appraisal of discoveries, and plan revitalization of existing brown fields. Please elaborate on how you address these challenges in each of these areas.

OIL has been at the forefront of exploration activities in northeastern India and has made a number of significant discoveries in Assam and Arunachal Pradesh over the years. Despite this fact, hydrocarbon exploration towards making a sizeable discovery is always an arduous task. Technical competency aided by suitable technology is the bedrock for any successful exploration venture.



(Explaining the geological features in one of the drilled well locations in Oil India's OALP acreages during Oil India's internal Exploration & Development Conference that took place in January 2024 at Kolkata, India.)

Our play opening efforts for establishment of hydrocarbon presence at different levels within the Tertiary sections of Assam Shelf have led to a number of prolific oil and gas discoveries. Apart from conventional seismic surveys, OIL employs latest available technologies like Airborne Gravity Gradiometry (AGG) Gravity Magnetic, PST (Passive Seismic Technology), Hybrid Telemetry Seismic Recording System etc. to record geophysical data in logistically challenging areas and identify potential target areas for exploration.

Speedy appraisal of discoveries followed by aggressive development campaigns is our mantra for increasing and sustaining production. A major area of importance is the rejuvenation of our matured fields through revisiting vintage data with new insights and tools to drill infill locations targeting bypassed oil and maximizing output. Our study centers at Guwahati and Duliajan are constantly reviewing the existing as well as formulating new IOR/EOR schemes to sustain production from ageing assets. Re-imaging MPA (Main Producing Area) is currently the buzz word in OIL wherein we are planning to relook our entire area of production in Assam Shelf

through acquisition of high-resolution 3D seismic. This is being supplemented with aggressive reservoir specific development activities in our fields in Lakwagaon, Balimara, Baghjan, Kumchai in the northeast and Baghwala in Rajasthan, so that production is getting the desired boost. A number of IOR/EOR processes have been implemented by OIL since mid-sixties depending on the requirement and suitability. The noteworthy techniques that have been employed include infill horizontal drilling, radial drilling, hydraulic fracturing, gravel packing, electrical submersible pumps (ESP), gas lifts, chemical water shut-off, low salinity water injection (LSWI), polymer flooding, MEOR, microbial paraffin remediation etc.

Our reservoir management is in-line with standard Matured Asset Management practices that aid in maintaining production and improving recovery of our major producing fields. We have already set our goals on accelerated drilling coupled with better management of our producing wells. Regular updating of our sub-surface models also helps in putting optimized infill locations for draining unswept oil zones.



(Being greeted By Mr. B. S. Bora, Chief Geophysical Services, ONGC, with a plant-in-a-pot before participating in a panel discussion at the 2023 SPG Conference held at Kochi)

OIL has been able to maintain an annual oil production level of over 3 MMT year after year for the last several decades. While it is creditable to maintain this figure, is there scope for enhancing the production level? How has OIL's RRR (Reserve Replacement Ratio) been coming along over the last decade or so?

As mentioned earlier, we are dominantly operating in a basin that has witnessed extensive E&P activities over the years. The Assam Shelf Basin has attained high exploration maturity and despite this, there is no denying the fact that, OIL has done tremendously well in consistently accreting significant reserves on year-over-year basis while maintaining a healthy RRR>1.0 for more than a decade now.

I feel proud that during the financial year 2023-24, not only our combined production of crude oil and natural gas reached an all-time high, but we also completed drilling of the highest number of wells in the history of OIL. Naturally we are dreaming big to enhance both our drilling and production targets further up in the coming years.

Induction of advanced technology can help carry out more accurate reservoir characterization which can result in more favourable drilling outcomes. I am aware of the creation of 'Technothon' within OIL. Please tell us about it.

We have a structured process for facilitating technology providers to submit new and innovative technologies for our assessment and deployment based on merit and use. OIL has recently brought in a "Policy for

Technology Induction" and invites technology providers to submit their technology solutions encompassing the broad spectrum of Hydrocarbon Exploration, Development, Production and Transportation.

The Technology providers can directly approach OIL's concerned departments or can submit online application throughout the year. OIL continuously scrutinizes the direct and online submissions and invites the shortlisted technology providers for discussion and possible induction.

Much of the oil production for OIL comes from mature fields, and some of them have been put on EOR, which is being pursued quite passionately. Please tell us about the efforts being put in, as well as what type of EOR is being adopted and where. What has your experience been thus far?

On EOR studies and implementation, Low Salinity Water Injection (LSWI) has traditionally worked out to be the best EOR technique for our oilfields. We have also recently implemented a pilot Polymer flooding Project while CO2 flooding in two of our reservoirs is planned.

As far as capabilities are concerned, our Team at Centre of Excellence (CoEES) in Guwahati as well as the team at Field Head Quarters in Duliajan are quite capable on the study front. We also seek third party opinions on a time-to-time basis to validate the studies that we undertake. A world-class EOR laboratory is being set up at Centre of Excellence for Energy Studies, Guwahati.



(Engaged in a panel discussion at the 2023 SPG Conference held at Kochi)

OIL has also been successfully implementing Cyclic Steam Stimulation technique (CSS) in its Baghewala oilfield of Rajasthan Basin where its implementation has seen a boost to the production levels.

Is OIL implementing AI/ML applications or workflows aimed at generation or production enhancement at its oilfields?

OIL has always been focused on digital use to improve its work and efficiency. Use of technologies to enhance both exploration and development activities has been in our forefront. Various globally recognized software and fit for purpose technologies have been in use to enhance our capability of finding new oil and maximizing the productivity.

Recently we have also launched our CxO (Chief Experience Officer) dashboard DARPAN (Digitally Augmented Reflection of Performance and Analytical Narratives) under Project Drive. It is a digital dashboard for OIL's management to efficiently track various projects. The CxO dashboard marks another milestone towards the digital journey of OIL. It leverages advanced technologies and analytics to improve efficiency in our work, increase safety which for us is of

paramount importance and at the same time helps in effective decision making.

We are also looking to improve the efficiency of our studies through implementation of AI-based machine learning techniques as pilot projects. However, as per our assessments these technologies require further refinements and time prior to their full-fledged applications in workflows.

Let us turn towards the workforce in OIL. How are you ensuring that the up-and-coming geoscientists are being molded into OIL technical work culture, and the credentials of those individuals who have put in over 10 years of service are constantly upgraded?

OIL employs bright and young graduates from top educational institutions of the country. In their formative years in the organization, knowledge and skill upgradation of young officers is a top priority for the management. The work environment of OIL has genesis linked to more than 100 years of hydrocarbon exploration and our work culture in our day-to-day operations run like a well-oiled machine. It is expected that the current and future generation of OIL Indians value this work legacy and march ahead with greater success.



(Guiding Oil India's millennial geoscientist during Oil India's internal Exploration & Development Conference that took place in January 2024 at Kolkata, India.)

Moreover, the field of petroleum geoscience is constantly evolving to meet newer challenges and so one is required to keep oneself updated with the latest information. The company has a robust mechanism of identifying one's training needs and weaknesses and provides necessary trainings/workshops for competency build-up of an individual. Hand holding of juniors by seniors in various tasks is emphasized for faster, better, and error free decision making for success of a project. I am proud to be part of the OIL work legacy and hope this would continue for betterment.

What are some of OIL's aspirations to achieve by 2030 in terms of plans and their implementation?

The strategy of our company has been to consolidate its position as the leading operator in northeast India and carry out exploration in Category II & III basins in the coming years. As already mentioned, it is our top priority to explore potential areas in other sedimentary basins in search of discoveries and meeting our long-term production targets. We are also open to exploring all opportunities to improve our footprints in other energy businesses.

However, as the Director (Exploration and Development) my focus and desire are to remain

focused on play-based basin level exploration in Category I & II basins in our efforts on exploration success.

What is the most important thing that you learnt in your professional life thus far, or which influenced you in your life?

What I have learned is that everything in life either personal or professional is a project. In every project maintaining strict timeline for completion is the key to success. As a professional what I have followed is that

What would be your message for young geoscientists entering our profession?

I would suggest that as a young professional one should keep an open mind on learning and should try and keep on learning from the seniors. The country needs young minds to play a vital role in our quest for major discoveries.

I personally believe that in the Indian context, currently, what is required is a play-based basin level exploration in Category I & II as well as in Category I basin, wherein companies either alone or in collaboration should be allowed to collate data, put up additional information and arrive at the best possible opportunities for play based exploration success for the country. 

