



'Synergy within the team leads to success'

- A memoir by Dr. D. V. R. Murti



Dr. D. V. R. Murti consistently excelled in academics, graduating at the top of his class and earning the Andhra Pradesh State Merit Scholarship during both his undergraduate and postgraduate studies in physics. He received his Ph.D. in RF spectroscopy from Andhra University in 1977.

Joining ONGC in October 1980, Dr. Murti quickly specialized in seismic applications for hydrocarbon exploration. Over the next three decades, he served in a range of leadership roles—including team leader, seismic crew party chief, head of the Regional Computing Center (RCC), acreage and block manager—before retiring as general manager (geophysics) in 2009.

He became adept at designing acquisition geometries, conducting field experiments, and overseeing real-time quality control. He co-authored a manual for standardizing

quality practices in seismic data acquisition, which was adopted company-wide, and conducted training workshops for junior executives at the ONGC Academy. His efforts were instrumental in introducing multicomponent seismic acquisition in the Cambay Basin, significantly improving subsurface imaging in the Cambay, Krishna-Godavari (KG), and Cauvery basins.

Dr. Murti played a pivotal role in ONGC's first offshore 3D seismic survey over the G-1 and G-2 structures in the KG Basin, followed by a second project over GS-16. As head of RCC Jorhat, he introduced advanced processing techniques such as prestack time and depth migration, enhancing ONGC's regional processing capabilities.

A career milestone came with the drilling of well PH-9-1 in the Palk Bay area of the Cauvery Basin, based on a structure delineated by Dr. Murti in 1981. This well marked India's first hydrocarbon discovery in its eastern offshore waters. He also pioneered the application of principal component analysis and pattern recognition for seismic facies analysis, notably in the Neelam Field.

Dr. Murti presented 17 technical papers at international conferences and was a founding member of the Society of Petroleum Geophysicists (SPG). Since retiring, he has continued to mentor students, sharing his expertise in practical seismic methods for oil and gas exploration.

Dr. Murti graciously accepted our invitation to write his memoir for GEOHORIZONS and give us an honest and insightful reflection on a distinguished and impactful career.

- Rajeev Tandon

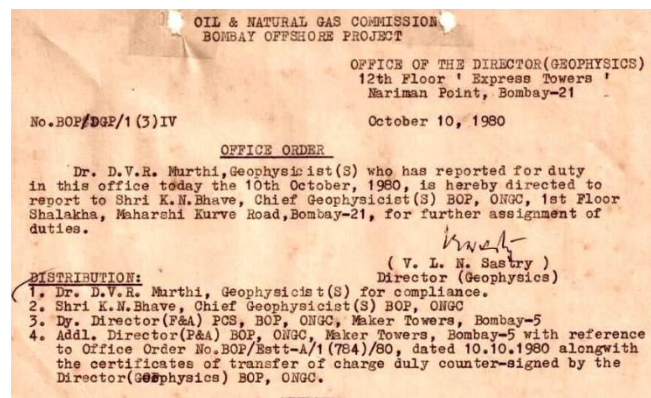
My early life

I was fortunate to be born into a family where both my parents and grandparents placed the highest importance on education. My academic journey began at Sri Raghavendra Elementary School in Arundelpet, Guntur, where I first learned the alphabet. I completed my high school education at Sri Majety Guravaiah High School, Guntur, and received the Secondary School

Leaving Certificate in 1965, graduating with first rank in my class.

I pursued my B.Sc. degree at Hindu College, Guntur, and went on to earn an M.Sc. in physics from the Andhra University Postgraduate Centre, Guntur. I was honoured to be a State Merit Scholar of Andhra Pradesh during both my B.Sc. and M.Sc. studies. My research focused on the application of Nuclear

Quadrupole Resonance (NQR) spectroscopy to molecular crystals, and I was awarded a Ph.D. by Andhra University in 1977. Subsequently, as a CSIR Pool Officer, I had the opportunity to teach mathematical physics to M.Sc. students at Acharya Nagarjuna University between 1976 and 1980. In 1979, the prestigious Oil and Natural Gas Commission (ONGC) announced openings for positions of geophysicists. I attended the interview at KDMIPE, Dehradun and was selected. I received my appointment via telegram and reported for duty to Mr. V.L.N. Sastry, Director of Geophysics at the Bombay Offshore Project (BOP), on 10th October 1980.



(Office order for my joining ONGC at Bombay)

Beginning of an exciting career

I attended a "reorientation training" program at Maker Towers, Bombay, conducted over a couple of weeks by senior experts who provided detailed insights into offshore seismic data acquisition. As part of the program, participants were taken aboard the M/V Anweshak for hands-on exposure to field operations. The training concluded with an interactive session led by Mr. V.L.N. Sastry and Mr. K.N. Bhawe.

Following the training, I was posted to the Field Base Office (FBO) of BOP in Chennai, where I reported to Dr. Y.B. Rao, Head of the Cauvery Offshore team.

It was at this stage that I recognized the importance of transitioning from my background in fundamental physics to the applied field of exploration geophysics. To bridge this gap, I began studying extensively, reading textbooks to build a strong theoretical foundation in geophysical methods for oil and gas prospecting, as well as in petroleum geology.

Working in FBO BOP, Chennai

My first project was titled "*Re-interpretation of Seismic Data Acquired by the Asamara Group in the North Palk Bay Area*," carried out under the guidance of Mr. C.V. Subba Rao.

At the time, no well data was available for the area. The nearest well, Delft-1, had been drilled by Sri Lanka in their territorial waters, but its data was not available. In the absence of known stratigraphy, we identified three prominent seismic horizons corresponding to unconformity surfaces. These were designated as H1, H2, and H3. Based on these, we generated isochron maps and isochronous pack maps. Using available seismic velocity data, we also attempted to create depth maps.

The interpretation revealed several independent closures as well as fault closures, which we named PH-7, PH-8, PH-9, and PH-10. The findings were presented to a visiting team comprising Mr. S.N. Talukdar (Member, Exploration), Mr. V.L.N. Sastry (Director, Geophysics, BOP), Mr. K.L.N. Rao (Director, Geology, BOP), and Mr. V.V. Sastry (OSD, KDMIPE). Following the protocol that the junior-most officer should present the data, I was given the opportunity to make the presentation, which was a memorable and invaluable experience.

Based on the data, Member(Exploration) approved two locations for exploratory drilling: one on PH-9, an independent closure, and another on PH-10, a fault closure. The well PH-9-1 successfully produced oil from the Upper Cretaceous. I vividly remember the excitement when the oil samples arrived at our FBO BOP office in Pondibazar—it was a moment of great pride. PH-9-1 became the first discovery well in the eastern offshore waters of India.

Later, I had the opportunity to work on a Well Seismic Survey (WSS) in PH-10-1 alongside a Vietnamese expert. This involved visiting an offshore jack-up rig, generating the time-depth curve, and constructing an interval velocity profile at the well location, which was an enriching field experience.

In 1981, I attended the Induction Training at Institute of Management Development (IMD), ONGC, where I gained a foundational understanding of Exploration & Production (E&P) concepts.



(Participants at the 1981 induction training at IMD, Dehradun)



(GP-4 Camp Anaparthi 1982 SIG AP-38)

Working at SRBC

During 1981–82, ONGC underwent a major restructuring, introducing the Business Centre concept, which led to the formation of the Southern Region Business Centre (SRBC). I was posted to the GP-4 seismic field party, tasked with acquiring seismic data in the Mandapeta–Ramachandrapuram area of the Krishna-Godavari (KG) Basin under SIG AP-38.

For the first time in the KG Basin, a detailed and comprehensive on-site field experimentation program was planned, under the guidance of Mr. S. Ray, then Head of the Geophysics Division at KDMIPE. The experimental work was executed over three different locations within the operational area, all within a month's time. I remain ever grateful to Mr. V.C. Ramaiah for his invaluable guidance throughout the process.

I carried out an in-depth study of the experimental data and successfully derived optimal acquisition parameters for production work. These findings were presented to Mr. K.R. Shenai, Head of Geophysics, SRBC, who approved the proposed parameters.

Following this, production seismic data acquisition commenced, and we were able to achieve outstanding data quality. GP-4 was recognized as the *Best Field Party of the Year*, and all team members, including myself, were awarded merit certificates in appreciation of our contribution.

Working in OCC, SRBC

In 1981–82, the Onland Contract Cell (OCC) was established within SRBC to oversee contract management and ensure real-time quality control in seismic data acquisition by foreign crews, along with collaboration in data processing. I was posted to OCC during this formative phase.

Among the major contracts executed during this period was the seismic data acquisition in the Amalapuram area by GSI Singapore, with subsequent data processing handled by CGG, France. Extensive field experimentation was carried out to determine the optimal acquisition parameters. I co-authored a comprehensive report on the experimental results, which earned me an appreciation letter from Mr. V.V. Sastry, OSD, KDMIPE.

One of our significant achievements was the successful shooting of a seismic line across the Godavari River, effectively connecting profiles from Blue Waters through the Transition Zone, into the Amalapuram and Mandapeta–Ramachandrapuram areas. This continuous profile delivered a vivid regional sub-surface picture, greatly enhancing our geological understanding of the area.

When a decline in data quality, particularly with respect to apparent frequency, was observed in a profile nearer to the coast, I took the initiative to attempt near-surface velocity mapping. The analysis revealed a low-velocity layer (LVL) approximately 15 meters thick, embedded between two high-velocity layers. This LVL gradually thinned inland and disappeared about 2 km from the

coastline. Implementing dynamic shot depths along dip profiles based on this finding significantly improved data quality. For my contributions to the project, I received a merit certificate and a cash award of ₹1,500 from Member (Exploration).



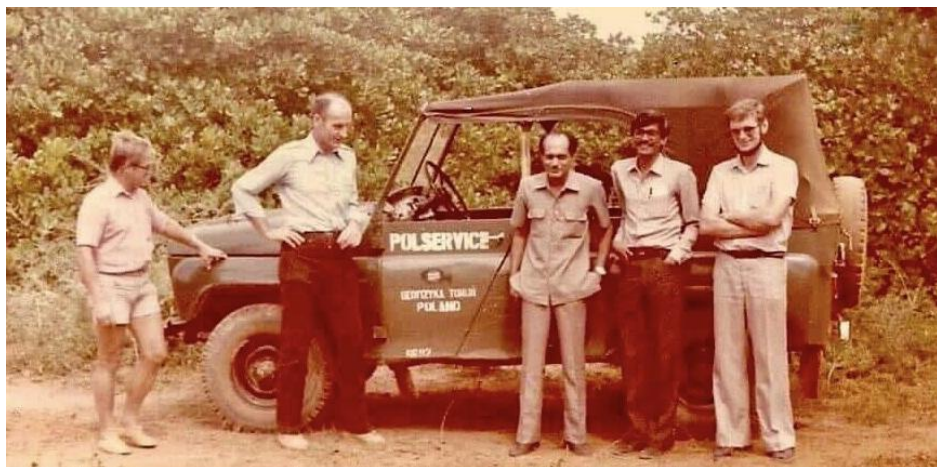
(Receiving M(E) cash award from RD KGC)

Following our work in the Krishna-Godavari (KG) Basin, we shifted operations to the Cauvery Basin, where we acquired seismic data acquisition in a particularly challenging terrain, specifically the Killai–Pitchavaram Mangrove Forest near Chidambaram. Despite the difficult logistics, high-quality data was successfully acquired by GSI.

I was then deputed to CGG Paris for work association, participating in the processing of seismic data acquired in the region by GSI. This exposure enhanced my understanding of international processing workflows and quality standards.

In a subsequent project, we collaborated with Polservice and GT, Poland, for the acquisition of extensive seismic data across the Cauvery Basin. During this project, we developed a systematic near-surface velocity model using advanced up-hole studies. This enabled us to dynamically determine shot hole depths along the profiles, ensuring optimal data quality.

The regional seismic lines acquired during this phase significantly improved sub-surface imaging across the basin. These high-resolution profiles played a crucial role in aiding interpreters with regional geological analysis and basin understanding.



(Working with Polservice, Poland in Cauvery Basin)

The third major project I was involved in was the seismic data acquisition in the Bantumilli area of the KG Basin, conducted by CGG France. I received a merit award for framing the technical specifications for this project, which laid the foundation for its successful execution.

Other notable projects I worked on were as follows:

- establishing shore-based navigation stations in Andaman Islands. As part of expanding ONGC's offshore capabilities, I played a key role in setting up six shore-based navigation stations in the Andaman Islands using Magnavox 1800 systems, in collaboration with the Bombay team. The stations were established at Little Andaman, Port Blair, Havelock, Neil, Rose, and Rangat Jetty, which was a vital step for offshore navigation and seismic operations in the region.
- offshore seismic data acquisition QC in KG Basin. I was involved in real-time quality control (QC) during offshore seismic data acquisition in the KG Basin using M/V RC Dunlop, ensuring the integrity and reliability of acquired data.
- Parameter designing in the first offshore 3D seismic data acquisition project –over G1 and G2 structures in KG Basin. I was instrumental in designing acquisition parameters for the first offshore 3D seismic survey over the G1 and G2 structures. Recognizing the growing importance of 3D seismic in the industry, I took the initiative to invite global leaders in 3D

exploration to deliver technical talks and presentations, thereby helping introduce and integrate 3D concepts into ONGC's workflows. I was actively involved in all stages of implementing offshore 3D seismic technology.

- 3D seismic data acquisition over Ravva (GS-16) Field. Under the guidance of Mr. V.C. Mohan, Head (Exploration), I was a core team

member in survey design for 3D seismic data acquisition over the Ravva (GS-16) field. The field posed two major challenges:

1. Shallow bathymetry ranging from 7 to 50 m, which made vessel maneuvering difficult—especially when shooting in the dip direction.
2. Ensuring continuous subsurface coverage beneath surface obstacles such as wellheads and pipelines.

To overcome these, we implemented interpolation techniques between acquired profiles, allowing for consistent and complete imaging.

Working in KDMIPE

In 1989, I was transferred from SRBC to KDMIPE, where I had the opportunity to work on five key projects, each contributing significantly to ONGC's exploration strategy and technical growth.

Project 1: Resource Appraisal in Collaboration with Russian Teams

In this project, I worked closely with Russian experts to carry out resource appraisal across various Indian sedimentary basins. We adopted standardized global methodologies for estimating hydrocarbon resources, tailoring them to Indian geological conditions. The outcome was a comprehensive report detailing resource estimates basin-wise, providing valuable inputs for strategic exploration planning.

In recognition of my contributions to this project, I was honored with a merit award by Dr. S.K. Biswas, then Director of KDMIPE.



(Receiving a merit award from Director KDMIPE)

Second Project: Reinterpretation of Neelam, Heera, Mukta, and B-134 Data, Bombay Offshore

I worked extensively on the reinterpretation of seismic and well log data from Neelam, Heera, Mukta, and B-134 fields in the Bombay Offshore area. This involved correlating geological and geophysical data, detailed fault mapping, and generating isochron, isopach, and depth maps delineating sequence boundaries across the region. These maps helped finalize drilling locations.

Simultaneously, I attempted a qualitative assessment of porosity distribution within the Bassein Limestone Sequence of Neelam Field by integrating seismic data with Pressure-Interval Velocity-Temperature (PIVT) logs. Given the inherent uncertainties in estimating porosity directly from seismic impedance (a velocity volume), our approach focused on delineating porosity trends rather than absolute values. The trends we identified showed strong correlation with laboratory data, validating the methodology.

I am grateful to Sri Gautam Sen, Chief Geophysicist and project leader, for his guidance throughout this project.

Our work was documented in the technical paper titled "Porosity Distribution in Bassein Limestone Sequence of Neelam Field, West Coast Offshore, India", presented at *The Second Seminar on Petroliferous Basins of India*.

Third Project: Team Leader Role — Application of Principal Component Analysis (PCA) for Seismic Facies Identification in Neelam Field

Stepping into the role of team leader, I led a project on the application of Principal Component Analysis (PCA)

to seismic datasets for identifying facies variation within the Eocene carbonate reservoir sequence of Neelam Field.

Seismic facies analysis uses seismic reflection data as a pattern recognition tool to characterize depositional environments. PCA, a dimensionality reduction technique, was applied to reduce complex seismic data to key components. By cross-plotting the first and second principal components derived from seismic data at drilled wells, distinct seismic facies patterns emerged.

Integrating these patterns with laboratory data, we successfully identified three reservoir facies: wackestone, packstone, and mudstone.

Our findings were presented at the Seminar on Pattern Recognition, Artificial Intelligence, and Neural Networks organized by the Indian Science Academy (Roorkee Chapter) and the Computer Society of India (Dehradun Chapter) in 1993. Prof. Khatri, Senior Professor at Roorkee University and session chair, personally congratulated me and my supervisor, Dr. Chetan Mehta, on the quality of our work.

Fourth Project: Reprocessing of Seismic Data, Endamuru Area, KG Basin

I contributed to the reprocessing of seismic data from the Endamuru area of the KG Basin. By effectively eliminating coherent noise in the receiver mode and applying partial pre-stack time migration, we significantly enhanced seismic imaging beneath the Raghavapuram shale base.

This improved imaging provided clearer subsurface insights and was well received when presented at the Regional Seminar of KDMIPE held at SRBC Chennai (October 13, 1992), garnering appreciation from both processors and interpreters.

Fifth Project: Reprocessing and Interpretation of Seismic Data in Nannilam-Kamalapuram Area, Cauvery Basin

I worked on reprocessing and interpreting seismic data from the Nannilam-Kamalapuram area of the Cauvery Basin, with a special focus on porosity estimation within reservoir sequences using seismic data and PIVT studies.

This work culminated in a paper presented at the Annual Convention and Seminar of Exploration

Geophysicists held in Bangalore (February 6–8, 1995), highlighting the practical application of seismic and petrophysical integration in reservoir characterization.

Founding of the Society of Petroleum Geophysicists (SPG)

During the early 1990s, a small group of geophysicists working at ONGC Dehradun, under the inspiring guidance of Shri M.R. Rao, held regular Sunday meetings to discuss professional growth and collaboration. It was in one of these meetings that the idea of forming a formal society for petroleum geophysicists was proposed and warmly embraced. The name Society of Petroleum Geophysicists (SPG) was agreed upon, and the annual membership fee was set at Rs. 150.

As the eldest member of the group, it was my privilege, alongside Shri D.M. Nathaniel and Shri A.K. Dwivedi, to reach out to G&G personnel at KDMIPE and GEOPIC, explaining the vision and importance of the society and inviting them to join. The response was mixed initially, but the momentum continued to build.

At Shri M.R. Rao's behest, I undertook the task of drafting the bye-laws necessary for registering the society. With valuable assistance from two young executives from GEOPIC, we crafted comprehensive bye-laws that even included provisions for student chapters.

After presenting the framework to our Chairman, Shri S.L. Khosla, early in 1993, we successfully registered the Society of Petroleum Geophysicists in Dehradun, marking the official birth of SPG.

Today, SPG stands as a prestigious geo-scientific forum, hosting biennial conferences attended by internationally renowned scientists in oil and gas exploration. It remains a vibrant platform fostering knowledge exchange and professional development in the petroleum geosciences.

Working in Cambay Basin

In 1993, I was transferred from KDMIPE to the Western Region, Baroda, where I took charge as Party Chief of GP-3. Over the following years, I led several impactful seismic acquisition projects in the Cambay Basin, specifically targeting the Mehsana and Padra regions.

Project 1: Northern Plunge of Mehsana Horst

The first project involved seismic data acquisition in the northern plunge of the Mehsana Horst, aiming to define trap top geometry. Our primary targets were the Kalol and Kadi Formations in the eastern part, with additional focus on the Alluvial Fan system within the Olpad Formation in the western section.

A long regional seismic profile was acquired from the eastern to western margins of the Mehsana Horst, offering a broad subsurface view. The processed seismic section displayed exceptional clarity and was featured on display boards and in technical presentations, serving as a visual benchmark for seismic imaging quality.

I presented the technical findings during a camp session at GP-3 to our Basin Manager, Sri A.N. Thakre Sir, who appreciated the clarity and depth of work carried out by the team.

Project 2: South of Padra – Imaging Fractured Trap Reservoirs

In the second project, our area of operation shifted to south of Padra, focusing on fractured trap reservoirs juxtaposed against carrier beds, which served as potential reservoirs. Since P-wave data alone was insufficient to characterize the fractures, we emphasized anisotropy analysis using a combination of P- and S-wave data.

The P-wave data successfully revealed the geometry of the trap top and associated structural features, resulting in the identification of multiple exploratory drilling locations. This project emphasized the growing importance of multi-wave seismic techniques in complex geological settings.

Head of Quality Assurance Cell (QAC), Geophysical Services (1995)

In 1995, I took over as Head of the newly established Quality Assurance Cell (QAC) within Geophysical Services. The primary role of QAC was to oversee the quality of seismic data acquisition—including 2D, 3D, and VSP data—by departmental crews.

We emphasized that seismic data quality in a production environment is driven by the three M's: Men, Machine, and Material. However, because of the heterogeneous and anisotropic nature of the subsurface, standardizing acquisition quality across a basin was challenging.

To address this, we developed a methodology to quantify seismic data quality, assigning experience-based weight factors to various acquisition parameters, resulting in a 100-point quality scale. This system allowed objective analysis of relative quality across different sub-tectonic blocks.

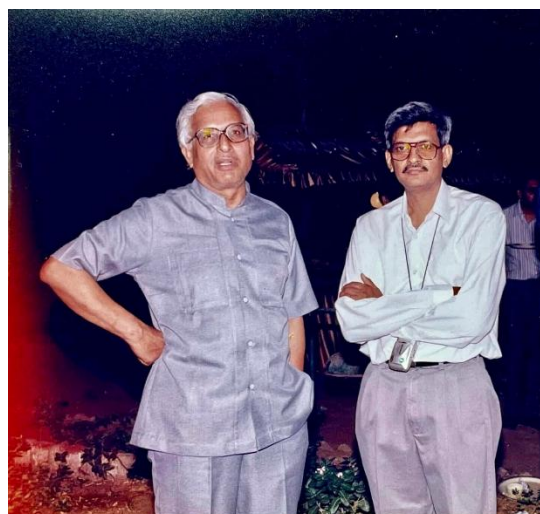
Our work led to continual improvements in seismic data quality, earning appreciation from field supervisors, acquisition teams, and support from ONGC management.

In SPG Conference 2002, I presented a poster titled "Role of Quality Concept Implemented in Cambay Basin," showcasing QAC's contributions to improving seismic acquisition standards.



(At the 2002 SPG Conference)

I am ever thankful to my mentor Mr. N.C. Sharma, HGS, keeping confidence in me, giving me various projects.



(With my mentor Mr. N.C. Sharma, Head Geophysical Services)

While serving as Head of the Quality Assurance Cell (QAC) in ONGC's Geophysical Services, I had the privilege of working under the mentorship of Mr. N.C. Sharma, HGS. During this period, I was involved in several significant technical initiatives, all of which were successfully completed. These included:

- Preparation of a Hand Booklet on Map Projections — A practical guide for field teams and interpreters.
- Introduction of GPS Technology in seismic data acquisition operations, significantly improving positional accuracy.
- Preliminary Project Report on Seismic Imaging Beneath Trappians — Addressing one of the key geological challenges in India's sedimentary basins.
- Initial Project Report on Block-8 (Iraq) — Focused on evaluating seismic acquisition feasibility and imaging challenges.
- Preliminary Feasibility Study in a Block in Kazakhstan — Assessing exploration potential and data acquisition logistics.
- Work Association in "Cambay Basin Reappraisal" with renowned French consultant Dr. M.L. Bordenovo.
- Implementation of Multicomponent Seismic Technology in the A-M tectonic block, Cambay Basin.
- Technical Presentations to Visiting Dignitaries, including senior ONGC officials and international experts.

I would like to touch upon two projects, Cambay basin reappraisal and multi component seismics.

The *Cambay Basin Reappraisal Project*, executed in collaboration with French consultant Dr. M.L. Bordenovo, was a strategic initiative to redefine exploration focus in this prolific basin. I was part of the core team working closely with the consultant on the following key study areas:

- Evaluation of source rock quality and distribution
- Thermal maturity modeling and hydrocarbon generation potential

- Regional stratigraphic correlation and depositional environment analysis
- Study of reservoir heterogeneity and unconventional hydrocarbon potential
- Understanding of basin evolution and structural framework

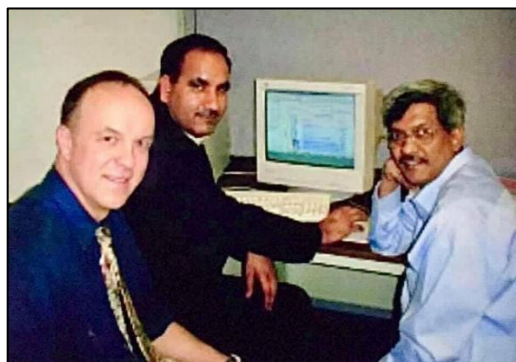
As part of my contribution, I integrated time and depth maps at key stratigraphic levels for both northern and southern tectonic blocks, facilitating a more accurate regional geological interpretation and guiding future exploration strategy.

Multicomponent Seismics – Cambay Basin (A-M Tectonic Block)

This project marked the introduction of multicomponent seismic technology in ONGC, specifically in the A-M tectonic block of the Cambay Basin. I was closely associated with the project from its inception, playing a key role through the following stages:

- Initial feasibility studies to assess the viability of multicomponent acquisition in the block
- Coordination of modeling studies with CREWES (Consortium for Research in Elastic Wave Exploration Seismology), at the Department of Geology and Geophysics, University of Calgary, Canada

Multicomponent seismic (3C/4C) was a forward-looking technology aimed at characterizing fractured reservoirs, imaging beneath complex overburden (like traps), and understanding anisotropic behavior in the subsurface. My involvement spanned both technical evaluation and strategic planning for its deployment in field conditions.



(In work association with CREWES, University of Calgary)

The South Kadi–Nandasan area in the Cambay Basin was identified as the pilot site for implementing multicomponent seismic technology, with one of the primary objectives being the precise delineation of lenticular sand bodies embedded within a shale environment, a well-known geological challenge in the basin.

A significant advantage for this project was the availability of offset VSP data from the well South Kadi-65, which enabled accurate estimation of V_p/V_s ratio, which was crucial for reliable modeling studies and wavefield analysis.

Work Association with CREWES, University of Calgary (2002)

In 2002, I travelled to the CREWES (Consortium for Research in Elastic Wave Exploration Seismology), at the University of Calgary, Canada, along with my colleague Shri Z. S. Sagwal. We worked directly with Prof. R.R. Stewart and his research team to finalize the acquisition parameters for the multicomponent seismic survey in South Kadi–Nandasan.

Our collaboration focused on:

- Elastic wavefield modeling
- Survey geometry optimization for multicomponent acquisition
- Target-specific parameterization based on geological objectives

The insights gained during this collaboration laid the groundwork for one of ONGC's first structured forays into advanced seismic technology.

Knowledge Sharing and Industry Recognition

As part of knowledge dissemination, I delivered a technical talk titled "*Multicomponent Seismics: Theory and Practice*" at the SPG Baroda Chapter. In the session, I presented key findings from our modeling studies and outlined the practical considerations in applying multicomponent seismics in Indian basins.

The presentation was well received by the geoscience community, and I was honoured with a memento by Basin Manager Mr. Mandal in recognition of my contributions.



(Receiving a memento from Basin Manager, Baroda)

During the course of seismic data acquisition in the A-M tectonic block of the Cambay Basin, we had the privilege of hosting Mr. Y.B. Sinha, Director (Exploration), and Mr. R. Venkata Rangan, Head of the Exploration & Development Directorate, ONGC.

I was entrusted with delivering a comprehensive technical presentation to the visiting dignitaries. My presentation covered the ongoing acquisition projects across the Cambay Basin, crew performance metrics, and quality management systems implemented during field operations, including multicomponent seismic acquisition.

The dignitaries expressed strong appreciation for the quality of work, data management, and the strategic approach undertaken by the teams. Their acknowledgment was a significant morale booster and a testament to the commitment and technical excellence of the entire field crew and support teams.

Working in RCC Jorhat

In 2003, I was transferred from Baroda to Jorhat, where I assumed the role of Head, Regional Computer Centre (RCC). At the time, RCC was equipped with IBM hardware and CGG software, with capabilities limited to 2D/3D time-domain seismic processing and post-stack migration.

Recognizing the need for technological advancement, I initiated a step-by-step transformation entailing enhanced computational capability by expanding the node architecture, successfully introduced 3D Pre-Stack Time Migration (PSTM) into the processing workflow, and undertook and achieved ISO certification for the

centre—establishing RCC as a quality-driven and process-oriented facility.

To keep pace with evolving exploration needs, I led the fast-track implementation of 3D PSDM capabilities, procured SGI hardware and Paradigm software suite, and successfully executed a pilot 3D PSDM project, validating both the infrastructure and workflow design.

Under my leadership, RCC underwent a significant transformation, becoming a self-sustained centre of excellence capable of advanced 3D PSTM and PSDM processing, modeling studies for 3D acquisition geometries, and VSP processing.

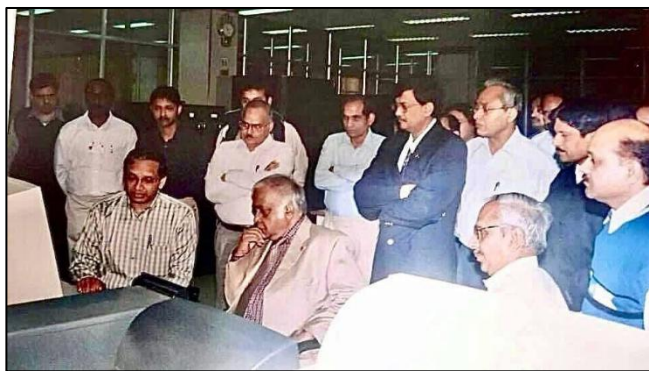
We also initiated the development of a business model aimed at offering seismic data processing services to the Indian energy industry on a contractual basis, a forward-thinking step toward operational self-reliance and external engagement.

Visit of CMD to RCC

During his official visit to the Assam & Assam Arakan (A&AA) Basin and Asset, the then CMD of ONGC, Mr. Subir Raha, had allotted a brief five-minute slot in his schedule for the Regional Computer Centre (RCC). It was a matter of great pride and privilege for me and my team to receive the CMD at RCC.

On his arrival, I mentioned that we had prepared a short presentation to showcase our recent developments. He graciously agreed, settling into a regular working chair in front of a monitor, and encouraged us to begin.

Mr. Manoj Jain delivered a comprehensive presentation, covering the technological upgrades, key projects, and the evolving capabilities of RCC. What was meant to be a five-minute slot extended into a thirty-minute interactive session, during which Mr. Raha deeply engaged with the content and showed keen interest in the centre's transformation. The visit also earned us positive acknowledgment from the Basin Manager and senior G&G personnel, who expressed their satisfaction and pride in RCC's evolution as a technologically advanced and self-sustained processing hub in the region.



(Mr. Subir Raha, the then CMD, ONGC visiting RCC, Jorhat)

The then Director (Exploration), Mr. Y. B. Sinha, visited RCC and engaged in a detailed interaction with the team. He reviewed the processed sections of the Assam Shelf and elaborated on the exploration strategy. The discussions involved the Basin Manager, Block Manager (HGS), and the RCC team. Director (Exploration) appreciated and acknowledged the valuable work being carried out at RCC.

I was entrusted with an additional and significant responsibility to lead the QC team of Geophysical Services. During this period, I also had the privilege of contributing as a co-author to Quality Seismics-2, a follow-up to Quality Seismics-1, which had been adopted by departmental field crews.



(The then Director(Exploration), Mr. Y. B. Sinha engaged in a technical interaction at RCC)

Sharing my knowledge and experience with junior executives became an important part of my journey,

particularly through engagements at the ONGC Academy. Toward the end of 2003, I was honored to receive an invitation from the Academy to conduct a workshop on Seismic Data Acquisition Techniques and Field Management.

It was a privilege to lead this workshop, along with my co-faculty, for nine consecutive years—from 2003 to 2011. The six-day program focused extensively on effective field techniques for seismic reflection data acquisition and 3D modeling studies. One of the days included a field trip dedicated to topographic surveying.

Geophysicists from other exploration and production (E&P) companies across India and Bangladesh participated, alongside executives from ONGC, making the workshop a rich platform for technical exchange and learning.

I was visiting faculty and examiner for M. Tech Petroleum Engineering students in Dibrugarh University.

Final phase of service-Working in Cauvery Basin

In 2006, I was transferred from Jorhat to Chennai and posted as Block Manager for the Cauvery Offshore and Ramnad sub-basin. Significant emphasis was placed on deep-water exploration, particularly in blocks CY-DWN-2001/1 and KK-DWN-2001/1, with water depths reaching approximately 2,500 meters.

In the CY-DWN block, Q-Marine seismic data was acquired by WESGECO, processed, and interpreted in-house. This was a stand-alone dataset—no well data or interpreted seismic data from nearby areas were available, posing a unique challenge.

During interpretation, a strong amplitude event exhibiting stacking with relatively high velocity and structural features drew the attention of the G&G team. As exploration is fundamentally a risk mitigation exercise, we adopted multiple approaches to improve confidence and convergence in identifying a potential drilling location.



(With participants and dignitaries of ONGC Academy)

Controlled Source Electromagnetic (CSEM) studies were conducted by Rocksource, which identified an anomaly aligned with a favorable structural setup. Further, we collaborated successfully with WESGECO to perform simultaneous inversion on pre-stack seismic data to extract rock property information in the target zone.

To further validate our findings, the data was critically reviewed on workstations at our Chennai office by Prof. R.M. Slatt, a renowned geologist specializing in reservoir characterization from the School of Geology and Geophysics, University of Oklahoma.

Despite the comprehensive, multi-disciplinary approach, the exploratory well did not yield success. The high-amplitude seismic event turned out to be basaltic flows, an outcome that could not have been anticipated with the data available before drilling. This underscored the inherent uncertainties in frontier exploration.

The last major project I undertook before my retirement on 31st July 2009 involved finalizing the technical specifications and contractual framework for

seismic data acquisition in ultra-deepwater blocks (up to 3,000 meters), including floating a global tender.

I also had the privilege of serving as Vice President of the Society of Petroleum Geophysicists (SPG), Chennai Chapter during 2008–09.

Over the course of my career at ONGC, I actively participated in various international symposia and had the honor of presenting seventeen technical papers.

My retired life

Throughout my career, I have been passionate about educating the student community on industry practices. I have delivered presentations on **“Seismic API for Oil & Gas Exploration”** at prestigious institutions such as Cochin University, IIT Chennai, IIT Kharagpur, IIT Mumbai, Vignan University (Guntur), and Hindu College (Guntur).

To conclude, finding oil is never an easy task. Seismic exploration for oil and gas is a technology-driven discipline, and with technology advancing rapidly in multiple directions, continuous learning is essential for every practicing geoscientist. Success in this field relies heavily on cohesive teamwork and collaboration.



(Superannuation from ONGC on 31st July 2009)

Exploration is fundamentally a risk mitigation process where failure is an inevitable part of the journey toward success. To overcome setbacks and keep pushing forward, I have always drawn inspiration from the words of Swami Vivekananda:

"Arise! Awake! And stop not till the goal is reached."

It has been a great source of satisfaction for me to work at ONGC alongside seasoned experts and inspiring role models. I take immense pride in being a geoscientist. 

Some interesting quotes:

"Science is bound, by the everlasting vow of honour, to face fearlessly every problem which can be fairly presented to it."

- John Tuzo Wilson, a pioneering Canadian geophysicist and geologist whose work was foundational to plate tectonics and transform faults. This quote is from his 1963 paper on transform faults.

"Every earthquake teaches us that we still don't know enough."

- Commonly cited among seismologists

"Never be limited by other people's limited imaginations."

- Mae Jemison, an American physician, engineer, and former NASA astronaut

"The Earth speaks in waves. We just need to listen more carefully."

- An expression used by seismologists about interpreting seismic waves.