प ख नि समाचारपत्र
AMD NEWSLETTER

परमाणु खनिज अन्वेषण एवं अनुसंधान निदेशालय (प ख नि) का वार्षिक प्रकाशन
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विषय वस्तु Contents

प ख नि के नए निदेशक
AMD HAS NEW DIRECTOR

Dr. D. K. Sinha, Additional Director assumed the office of the Director, AMD w.e.f. 1st January, 2020. Glimpses of the occasion are presented below:

***Dr. Deepak Kumar Sinha**, after obtaining M.Tech in Applied Geology from Dr. Harisingh Gour University, Saugor, Madhya Pradesh joined AMD in 1984. He was awarded Ph.D. degree in Geology by Rashtrasant Tukadoji Maharaj [RTM] Nagpur University, Nagpur in 1993.*

Dr. Sinha has vast experience in exploration of atomic minerals spanning over 35 years in different geological domains of Eastern, Western and Central parts of India. During his formative years, he has worked extensively in many parts of Madhya Pradesh and Chhattisgarh. Subsequently he has been associated with exploration in several important geological domains of Rajasthan. He has served as Head, Planning and Management Services Group, Deputy Regional Director, Western Region and Regional Director, Eastern Region. As Additional Director, he has effectively guided and monitored the Airborne and Heliborne survey operations for uranium exploration in different parts of India and Enterprise Level Geospatial Database Management System (EGDMS) project of AMD.

Dr. Sinha is a devoted researcher in exploration geology and has widely traversed across the country to gain experience in geo-exploration. He has conceived many new concepts which are widely implemented in uranium exploration programme of the country. His skillful exploration strategy resulted in significant augmentation of atomic minerals in the states of Madhya Pradesh, Chhattisgarh, Rajasthan and Jharkhand. His strong geological acumen to collaborate with Universities and Research Institutions has been widely appreciated by academia. He is an adjunct professor in Homi Bhabha National Institute (HBNI), Mumbai, an institute of national importance and a recognised Ph.D supervisor for RTM Nagpur University, Nagpur and Osmania University, Hyderabad.

Dr. Sinha was deputed to participate in international events like Prospectors and Developers Association of Canada (PDAC) in Toronto, Canada in 2013 and URAM-2018 technical meeting in IAEA, Vienna in 2018.

Dr. Sinha has published many research articles in national / international journals and has more than 100 citations. Dr. Sinha is a life fellow of Geological Society of India, Bengaluru and Indian Nuclear Society, Mumbai.

Dr. Sinha is a recipient of "DAE Special Contribution Award-2011" in recognition of his contribution in the field of Nuclear Science and Technology.

निदेशक का संबोधन
MESSAGE FROM DIRECTOR

(Excerpts from the message delivered by Director on 1st January 2020 in H.J. Bhabha Auditorium, AMD, Hyderabad and through video conference to all Regions)

My Dear Colleagues,

I wish you all and your family members a very happy, healthy and prosperous New Year – 2020 through this edition of the Newsletter. The year 2020 is the beginning of a new decade and therefore is the best time for a thorough introspection of our achievements in the last seven decades and our plans for this decade as well as vision for 2030, towards attaining self-sustenance in nuclear fuel supply. In this direction, AMD is making new commitments to our principal by accepting the mandate of establishing 1,50,000t uranium oxide by 2024, with a vision to add similar resources till 2030.

This mammoth task is likely to be achieved by substantial addition of uranium resources from Southern Cuddapah Basin, Bhima Basin, North Delhi Fold Belt and Singhbhum Shear Zone. The other potential areas are Kaladgi Basin, Chhotanagpur Granite Gneissic Complex (CGGC), base of Vindhyans including Aravalli and Bijawar Basins, Dongargarh-Kotri Rift Zone, Siwalik Basin, Gondwana Basins, new Kudada type mineralisation and IOG Basins. The vision for 2025-30 is based on these areas, from where significant prospects are likely to emerge as mining centres. Integrated exploration with substantial heliborne survey component is envisaged over these promising areas.

AMD has successfully established the REE and Nb potential of Ambadongar Carbonatite Complex, Gujarat and Siwana Ring Complex, Rajasthan. Prospecting work is continuing for estimating the REE resources of Ambadongar at 2% REE(T) cut-off, in order to make it a truly world class deposit. Similarly, in line with the country's requirement, we are trying to look for multi-metal deposits containing uranium and other strategic metals. In addition, AMD has revitalised the exploration efforts for lithium and helium in potential geological domains.

We are facing several impediments towards achieving the mandate due to logistics, law & order situations, statutory forest clearances, etc. I sincerely thank all our field officials for keeping their morale high despite these hindrances in our exploration programme. AMD has always risen to the expectations of the Department and I hope in future, we will continue to do our best. In the light of above, exploration in potential areas of Meghalaya, Telangana and Andhra Pradesh, where rich uranium tenor of >0.1% U_3O_8 is expected, will continue to be under suspension for the time being till conditions become favourable. Efforts are being made to commence exploration in these promising areas.

Mineral exploration progresses concomitantly with Research and Development (R & D) as it opens up new ideas, plausible hypothesis and midcourse corrections required for quality outputs. I am committed towards prioritising research as an integral part of our work culture and develop good number of quality research projects through BRNS and in-house facilities. Consequently, interactions with Universities / Institutions through MoU, would be facilitated for knowledge enhancement in AMD and also for the development of human resources in Universities / Institutions. This I hope will greatly enhance the visibility of AMD in geological and exploration fraternity.

The major onus for achieving our mandate lies on our middle level officers, who are the link between the management and the officials in the field. Their involvement in the technical matters keeps the morale of the field officials high, to get the desired success. Similarly, the role of BARC Training School (BARCTS), AMD Campus, in realizing our aspirations is immense. Trained officers from BARCTS, after gaining sufficient experience, are set to become the main work force of the organisation and would be nurtured for shouldering higher responsibilities in the ensuing decade.

Laboratories are our integral part and their prompt, accurate analytical support and enhanced output are the strengths of our exploration programme. These may require many upgraded versions of the instruments which will be added to the already existing fleet of AMD. An advanced mineral science facility at Kolkata is expected to be functional in 2020-21.

AMD is having the best drilling capabilities in the country among the government sector. Presently, 17 out of our 35 drilling machines are hydrostatic and are providing good performance. The drilling workforce is getting reduced because of superannuation of our expert technicians. The young Scientific Assistants are trained to take up additional responsibilities in future. They are technically qualified and enthusiastic for providing best performance. In addition, to support the exploration programme, the quantum of contract drilling will be enhanced significantly to achieve the desired goal.

Our Administration and Accounts officials have always stood up to the expectations and are expected to continue to do so in future as well. The support rendered by our technicians, surveyors, draughtsmen, drivers, security personnel, work assistants, etc. has always been exemplary.

This edition of the Newsletter has documented the activities of AMD in the last one year and I immensely feel satisfied to observe the holistic growth of AMD in all the spheres of its activities. I hope the Newsletter will give an interesting reading to one and all on progressing AMD.

Jai Hind !

भारत के माननीय उप राष्ट्रपति का प ख नि में दौरा
VISIT OF HON'BLE VICE-PRESIDENT OF INDIA TO AMD

Hon'ble Vice-President of India **Shri M. Venkaiah Naidu** graced the occasion of 70th Glorious Year Celebrations of the Atomic Minerals Directorate for Exploration and Research held on 16th May 2019, in AMD Complex, Hyderabad. All the officers and staff of AMD Headquarters and South Central Region rendered a warm welcome to the Hon'ble Vice-President.

In his thought provoking address to the officials of AMD, the Hon'ble Vice-President appreciated the efforts of AMD in expanding the atomic mineral resource base of the country and pointed out that nuclear energy could significantly reduce Greenhouse Gas Emissions and has the potential to meet the increasing energy demand in the country. He concluded his address with the statement "We need to develop new and more efficient technologies to utilise our resources to the maximum". Several dignitaries from Government of Telangana and Heads of other DAE units in Hyderabad attended the event.

The address of Hon'ble Vice-President is available in Prasar Bharati and Rajya Sabha Channel and can be accessed by (http://prasarbharati.gov.in/playvideo2.php?l=jACQp_EI7kE) and (http://rstv.nic.in/nuclear-electricity-can-reduce-greenhouse-gas-emissions-vice-president.html)

प ख नि प्रबंधन परिषद COUNCIL OF MANAGEMENT OF AMD
(RECONSTITUTED ON 5TH NOVEMBER, 2019)

1	Chairman, AEC and Secretary, DAE	Chairman
2	Dr. G.K. Dey, Former Director, Materials Group, BARC	Co - Chairman
3	Joint Secretary (R&D), DAE	Member
4	Joint Secretary (F), DAE	Member
5	Chairman and Managing Director, UCIL	Member
6	Chairman and Managing Director, IREL	Member
7	Director, National Geophysical Research Institute (NGRI)	Member
8	Dr. Ashwini Kumar Rai, Former Director, AMD	Member
9	Shri Ravi Prakash Verma, Former Deputy Director General, GSI	Member
10	Director, Materials Group, BARC	Member
11	Director, AMD	Member
12	Additional Director (Operations-I), AMD	Member
13	Additional Director (Operations-II), AMD	Member
14	Additional Director (Operations-III), AMD	Member
15	Shri Baltej Singh, Member, NCPW, DAE	Member
16	Additional Director (R&D), AMD	Member
17	Head, PMSG, AMD	Non-Member Secretary

उपलब्धियाँ : वार्षिक कार्यक्रम 2018-19
ACHIEVEMENTS: ANNUAL PROGRAMME 2018-19

Atomic Minerals Directorate for Exploration and Research (AMD) has continued the pace of exploration activities during the Annual Programme 2018-19 by integrated, multi-disciplinary methodology and judicious utilisation of manpower with a focussed approach for augmentation of uranium, thorium, rare metals and rare earth resources. The salient achievements during November 2018 to October 2019, are as follows:

- 24,966t in-situ uranium oxide (U_3O_8) has been augmented, which includes 20,585t in Tummalapalle and adjoining blocks, Kadapa district, Andhra Pradesh; 1,101t in Banadungri-Singridungri, 1,665t in Narwapahar and 135t in Jaduguda North, East Singhbhum district, Jharkhand; 98t in Bangurdih, Seraikela-Kharswan district, Jharkhand; 955t in Rohil West, Sikar district, Rajasthan; 199t in Kanchankayi, Yadgir district, Karnataka and 228t in Wahkyn-Wahkut, Southwest Khasi Hills district, Meghalaya. The country's uranium resource has been updated to 3,25,000t in-situ U_3O_8.
- Reconnaissance (7,104 sq km) and detailed (401 sq km) surveys helped in locating significant uranium occurrences in migmatite of Chhotanagpur Granite Gneiss Complex (CGGC) in Sonbhadra district, Uttar Pradesh; Singrauli district, Madhya Pradesh and Balrampur district, Chhattisgarh; Malhera Chert Breccia Formation of Bijawar Group in Chhatarpur district, Madhya Pradesh; Cataclasite-mylonite zones in granite in Kadapa, Chittoor and Anantapur districts, Andhra Pradesh; Iron breccia and magnetite quartzite of Khetarbari Formation of Bomdila Group, West Siang district, Arunachal Pradesh; Contact of quartz muscovite schist (Raialo Group) and quartzite (Alwar Group) and carbonaceous phyllite in Alwar district, Rajasthan and leucogranites of Peninsular Gneissic Complex, Kurnool district, Andhra Pradesh.
- 2,56,034m (Departmental: 87,652m and Contract: 1,68,382m) drilling was carried out for uranium and RMRE investigations.
- Significant uranium mineralised intercepts / bands have been intercepted in boreholes drilled at Naktu - Anjangira, Sonbhadra district, Uttar Pradesh; Rajpura & Loharkar, Una & Hamirpur districts, Himachal Pradesh; Kanchankayi and Suldhal-Gujanal, Yadgir and Belagavi districts, Karnataka; Tummalapalle and adjoining blocks (Kanampalle, Motunutalapalle, Gidankivaripalle, Bakkanagaripalle and Rachakuntapalle - East), Kadapa district, Andhra Pradesh; Jaduguda (North), Narwapahar Deep, Kudada, Rajdah, Baglasai-Mechua, Bangurdih and Gura-Dugni, East Singhbhum and Seraikela - Kharswan districts, Jharkhand; Rohil (Central and West), Narsinghpuri, Jahaz, Geratiyon ki Dhani and Ladi ka Bas, Sikar and Jhunjhunu districts, Rajasthan; Dharangmau, Betul district, Madhya Pradesh and Sarangapalli, Guntur district, Andhra Pradesh. New potential/significant mineralisation have been identified in Dhoha-Dursendi, Gwalior district, Madhya Pradesh; Kanchankayi East – Hulkal West, Yadgir district, Karnataka and Umra NE Extension, Udaipur district, Rajasthan.
- Geochemical surveys (4,695 sq km) carried out in different parts of the country resulted in delineation of important uranium anomalous zones in Kanamaipatti, Madurai district, Tamil Nadu and Pachpadra area, near confluence of Saraswati palaeochannel and Luni river, Barmer district, Rajasthan.
- Ground geophysical surveys (Regional: 652 sq km and Detailed: 399 sq km) have delineated potential high chargeability- low magnetic zones south of Rohil Uranium deposit, Ladi ka Bas and Geratiyon ki Dhani areas, Sikar district, Rajasthan; anomalous chargeability zones and deep seated faults along Rudravaram lineament, Kurnool district, Andhra Pradesh; extensions of potential fracture zones in Kanchankayi and Gujanal, Yadgir and Belagavi districts, Karnataka and at Rakshakhand, Balrampur district, Chhattisgarh.
- Heliborne geophysical (TDEM, magnetic and gamma-ray spectrometric) surveys have been carried out over 26,966 line km in parts of Alwar Basin in North Delhi Fold Belt, Rajasthan where discrete conductors and subsurface structural elements were delineated.
- Reconnaissance (758 sq km) and detailed (6 sq km) surveys have been carried out in parts of Odisha, Chhattisgarh, Karnataka, Rajasthan and Gujarat for RM&RE mineralisation. 1,076 kg columbite-tantalite has been estimated in pegmatites in Mandya district, Karnataka, Jharsuguda district, Odisha and Surajpur district, Chhattisgarh. 3,001 kg columbite-tantalite and 1,100 kg beryl as by-product have been recovered in units of Odisha and Karnataka. 7,700 kg xenotime bearing poly-mineral concentrate has also been produced at Siri River plant, Jashpur district, Chhattisgarh. Reconnoitory core drilling (7,079m), in Siwana Ring Complex, resulted in establishing the continuity of REE mineralisation over 2km strike length in Bhatikhera (microgranite dykes) and 600m in Ramaniya (granite), Barmer district, Rajasthan.
- Reconnaissance (439 sq km) and detailed (13 sq km) surveys for augmentation of Beach Sand Heavy

Minerals have resulted in establishing potential heavy mineral zones mainly along the east coast of India. Significant zones of Total Heavy Mineral (THM) concentration have been located at Melamvaripalem-Vadlavaripalem (up to 45%), Baipalli-Gunupalli coast (up to 36%) and Koyyam - Konada (up to 36%), West Godavari and Srikakulam districts, Andhra Pradesh and in mining leasehold areas of IREL (up to 71%), Ganjam district, Odisha. The country's total heavy mineral resources stand at 1,173 million tonne (Mt) which includes 12.47 Mt of monazite.

- ❖ Various laboratories (Physics, Chemistry, XRD, XRF, Petrology, EPMA, Geochronology and Stable isotope) provided effective analytical support to field investigations.
- ❖ Research and Development assignments (50 nos.) related to atomic mineral exploration have been continued in different field areas and laboratories.
- ❖ Software based unique application platform for exploration data management, Enterprise Level Geospatial Database Management System (U-explore) has been developed and launched into Go-Live mode. Video Conferencing Systems at AMD Headquarters and Regional Centres have been working satisfactorily. AMD's website (http://www.amd.gov.in) is being regularly updated.
- ❖ BARC Training School, AMD Campus, Hyderabad continued its activites wherein 17 Trainee Scientific Officers (TSO) of the 9th batch (OCES-2018) (13 Geology & 4 Geophysics) completed orientation training on 31-07-2019. 12 TSO's (10 Geology & 2 Geophysics) of the 10th batch (OCES-2019) are undergoing induction training.
- ❖ Presentation and publication of technical papers were continued in seminars/symposia and various journals.
- ❖ Public awareness programmes were organised in various cities as well as in remote field areas.
- ❖ Activities related to Human Resource Development continued with in-house and external training programmes for staff and officers.
- ❖ AMD Studentship programme (27 students) and BRNS projects (29 nos.) have been continued.
- ❖ 'Swachh Bharat' activities have been carried out at Headquarters and seven Regional Centres of AMD.

सेमिनार एवं संगोष्ठियाँ
SEMINARS AND SYMPOSIA

The National Seminar on **'Strategic Mineral Exploration for Sustainable Development: Emerging Trends and Challenges – SMEET-2019'** was organised in the newly constructed Nilgiri Auditorium, AMD Complex, Southern Region, Bengaluru during 7-8 May, 2019. The seminar was inaugurated by **Shri K.N. Vyas,** Chairman Atomic Energy Commission and Secretary, Department of Atomic Energy. **Dr. Dinesh Srivastava,** Chairman and Chief Executive, Nuclear Fuel Complex, Hyderabad also graced the occasion. The Abstract volume containing 73 technical papers from various institutions was released on the occasion.

The National Seminar on **"Sedimentation, Tectonics, Mineral Resources and Sustainable Development"** in association with Indian Association of Sedimentologists (IAS) was organised in AMD Complex, Hyderabad during 7-8 November, 2019. The seminar was inaugurated by **Prof. S.M. Casshyap,** Former Professor of Geology, Aligarh Muslim University, Aligarh. **Dr. Sanjeev S. Katti,** Director General, Oil and Natural Gas Corporation Limited – Energy Centre (ONGC-EC) graced the occasion as Guest of Honour. The Abstract volume containing 103 technical papers from various institutions was released on the occasion.

भारत में सामरिक खनिजों का अन्वेषण- पखनि की भूमिका

EXPLORATION OF STRATEGIC MINERAL RESOURCES IN INDIA – ROLE OF AMD

एम. बी. वर्मा M.B. VERMA

Shri M.B.Verma *obtained M.Sc (Geology) and M.Phil (Geology) from Aligarh Muslim University, Uttar Pradesh and joined AMD in 1982. He has vast experience of over 37 years and has worked in different parts of the country in various capacities. During the last decade he has contributed immensely as Deputy Regional Director, Southern Region; Regional Director, South Central Region; Additional Director and Director AMD since May, 2018. He retired as Outstanding Scientist and Director, AMD on 31st December, 2019 on superannuation.*

Prosperity of a nation greatly depends on proper utilisation and exploitation of mineral resources or their acquisition in case of non-availability. In India, based on the increasing demand from various industries, few minerals have been categorised as strategic minerals. Minerals of tin, cobalt, lithium, germanium, gallium, indium, niobium, beryllium, tantalum, tungsten, bismuth, selenium and REE which are required for various hi-tech industrial applications are included in this. Lithium is important for applications in nuclear and automobile industry. Besides, uranium, thorium and few critical raw materials including rhenium and graphite are also needed for energy security and also for 'Make in India' programme.

AMD has recently completed seventy (70) glorious years and established substantial U, Th and RMRE resources in different parts of the country. AMD has done its task very well and played a stellar role in atomic minerals exploration in the country by establishing 3.25 lakh tonnes U-oxide resources, distributed in 43 deposits across the length and breadth of the country. Apart from uranium, more than 12 million tonnes of monazite (thorium-REE mineral) resources are established in beach and inland placer sands. RMRE exploration has been confined to the granite-pegmatite domains of the country, till recently. But now, AMD has diversified the RMRE exploration into several other rock types also.

The Singhbhum Shear Zone (SSZ) and Southern Cuddapah Basin alone contribute >50% of uranium resources of the national inventory. Well known U-Provinces in the NE parts of the country require concerted exploitation/exploration efforts and large parts of Meghalaya plateau is still unexplored. Similarly, unconformity proximal U-deposits, with good U tenor, in the NW periphery of Cuddapah Basin (Srisailam & Palnad Sub Basins) remain unexploited due to various reasons. The maiden exploration efforts, based on heliborne ZTEM data to test deep seated U mineralisation along Rudravaram lineament, could not be continued because of prevailing unfavourable local conditions. AMD being one of the pioneer exploration organisations in the country is entrusted with the responsibility of identifying resources of raw materials required for our Nuclear Power programme. However, exploration of these resources in the most suitable domains is becoming more challenging because of variety of logistical reasons.

During the recent years, AMD has prioritised the geological domains for testing of concealed deep seated mineral resources. Continuity of uranium lodes are well established over a kilometre plan width in SSZ, dolostone hosted U-mineralisation in Cuddapah basin and ~ 800 m in Rohil U-deposit. These deposits give positive indication of continuity of mineralisation even at greater depths, probably polymetallic in nature and with enhanced tenor. Recently, China has established the presence of deep-seated Au + U and other sulphide deposits with high tenor. In this line, the need of the hour is drilling of deep boreholes in parts of Umra-Udaisagar Domain in Southern Rajasthan, Bhima Basin, SSZ and NDFB. Geomodelling is one of the options for exploration of concealed deep seated deposits.

Developing the green field areas as future uranium exploration targets is one of the long-term goals of AMD. A number of virgin/ potential geological domains are identified as the future targets for Iron Oxide Breccia Complex (IOBC) type deposits (Khetri basin, Rajasthan; Mahakoshal basin, U.P. and M.P; and Kotri - Dongargarh belt, Chhattisgarh). Similarly, extensive R&D is required to establish the uranium potential of the alkaline intrusives of the Southern Granulite Terrain (SGT), the basement / basin structures below the Deccan Traps, altered shear/ fracture zones in the remobilised granulites of Southern Indian Shield and phosphorites of India.

AMD has intensified the exploration of rare metals (Nb, Ta, Be and Li) and REE elements (La to Lu & Y) in different parts of the country. A paradigm shift in the strategy of exploring the carbonatite and intrusive – effusive complexes in India for REE, Nb and other elements has paid rich dividends. The carbonatite complex in Ambadongar, Gujarat is emerging as one of the largest REE deposit in the world along with appreciable resources of niobium and vanadium. Similarly, the Siwana Ring Complex, Rajasthan (HREE rich) possess huge potential for REE mineralisation.

Lithium, well known as "White Petroleum" is the most sought-after mineral commodity presently on a global scale. Required principally for battery applications in electric powered vehicles, which is environmental benign, lithium demand could be triple by 2025. Presently, few countries that produce lithium are Bolivia, Chile and

Argentina from brine and Australia from hard-rocks. The potential of India for lithium resources is yet to be fully explored. AMD's exploration efforts in the pegmatites of Nagamangala Schist Belt, Karnataka have brought to light its appreciable lithium potential. Lithium exploration is also initiated in the brines of Rajasthan. AMD's role in lithium exploration would become manifold in future.

Helium is one of the most required natural resources for a variety of applications in nuclear, medical, analytical, space and several other industries. Presently, India's entire helium requirements are met by imports. Higher concentrations of helium are mostly associated with groundwater, ancient brines and pore water, natural gas fields, ore deposits, hydrothermal fluids, volcanic degassing, oil field brines, coal measures, etc. The geothermal springs in the CGGC are known to contain higher helium concentration in West Bengal and Jharkhand. AMD has to develop a detailed protocol for helium exploration in geothermal springs and other suitable geological domains. Few initiatives have already been taken by AMD.

AMD, besides exploration of atomic minerals, which is to be complied as per the mandate, has to expand its domain for exploration for strategic minerals in view of the nation's requirements. Our country at present is heavily dependent on imports for the strategic minerals requirement, although we have a wide variety of geological domains suitable for hosting these resources. A more open system and public understanding is the need of the hour to take up challenging task of mineral exploration and support nation's interest. AMD has a dedicated team of scientists, expertise and capabilities to accept this challenging task to meet country's requirements.

I wish AMD great success in all its endeavours.

मेरा भी सपना है I TOO HAVE A DREAM

के. रमेश कुमार K. RAMESH KUMAR

Shri K.Ramesh Kumar *obtained M.Sc (Geology) from Osmania University, Hyderabad and joined AMD in 1981. He has vast experience of over 38 years and has worked in different parts of the country in various capacities. During the last decade he has contributed immensely as Head, Beach Sand and Off Shore Investigations; Regional Director, South Central Region and Additional Director. He retired as Scientific Officer – H+ and Additional Director on 31st July, 2019 on superannuation.*

I share with the young scientists of AMD few glimpses on my thoughts on what one can aspire for the growth and well being of an organisation.

As we are all aware, the essential thing for a scientist is to think up a theory. There is no way of mechanising the process. It always requires human imagination. In August, 2009 issue of JGSI, Dr. B.P. Radhakrishna, has quoted observations by several distinguished personalities on scientific temper. He quoted Reginald Daly as saying, at bottom of each, exact science is and must be speculative and its chief tool of research, too rarely used with both courage and judgement is the regulated imagination. He (Dr. BPR) further quoted Einstein who admitted that in science, imagination is more important than knowledge.

The dream which was nurtured over three decades of service in AMD was to see / locate a high grade and large tonnage uranium deposit in the Proterozoic rocks of the country. In my early years (1980s) in AMD, we used to hear about high grades of uranium ores mined and recovered from Umra, Rajasthan, in the rocks of Aravalli Supergroup. There was always an inner feeling that such high grade concentrations cannot be isolated and there would be a place where large tonnage concentrations can be found in Proterozoic rocks of Rajasthan.

AMD provided an opportunity for me to work in Rajasthan for locating Calcrete type uranium deposits. It is during this stint that the dream of finding Umra like uranium deposit found rejuvenated thoughts.

For those of you conversant with Umra and calcretes this link appears to be outrageous. But, yes, to begin with, in science, imagination is more important than knowledge.

Lachhri in Nagaur district, Rajasthan is one of the earliest known calcrete hosted uranium occurrences in Rajasthan after the occurrence of Kanji ki Sird in Bikaner. Lachhri occurrence in a playa environment is non pedogenic in nature, whereas Kanji ki Sird is of pedogenic origin. Lachhri occurrence brought to focus playa environment as a possible target area for surficial uranium. After locating uranium values in Lachhri sediments, the other playas were targeted for surveys. One such is the Didwana Playa spread over an area of about 10 sq km which rests on Palaeoproterozoic Aravalli Supergroup. The brines of the playa sustained huge production of sodium sulphate for over five decades which has since been discontinued. Presently, normal salt is being produced by evaporating the brines pumped out from lake bed. The playa has several pits of 4-5 m depth for drawing subsurface brines for salt production. The initial samples (lake sediments) both from surface and the pits contain upto 200 ppm uranium. As the pits in the lake bed exposed water table, hydrogeochemical samples were collected and analyzed. These samples

contain over 1,000 ppb uranium and abnormally negative (-) 200 meV to (-) 340 meV Eh values; alkaline (7.3 - 9.2) pH and SO_4 content ranging between 33,000 mg/l to 88,000 mg/l. When these data are plotted in the classical Eh-pH diagram, the samples occupy a field of precipitation of primary uranium. From the available data it is observed that the mineral solubility indices of brines in respect of uraninite and coffenite have (+ve) values. The Mineral Saturation Index (SI) is a measure of whether a water will tend to dissolve or precipitate a particular mineral. The high values of sulphate in the brines also calls for an insitu source of huge sulphide mineral accumulations. Three papers on these aspects were brought out in Current Science, Journal of Geological Society of India and Bhabha Birth Centenary publications.

These three communications brought out the possible mechanisms of uranium concentration, viz. (i) capillary action followed by evaporation in lake sediments above water table (ii) chemical precipitation brought about by Eh / pH of brines below water table and (iii) possibilities of uranium concentration in phyllites / quartzites / schistose rocks of Palaeoproterozoic Aravalli Supergroup. Based on the geological and geochemical observations, a large resource of uranium was modelled which could be a blind deposit waiting to be discovered.

Subsequent drilling though gave a different subsurface picture, the enigma of understanding higher uranium values in brines coexisting with negative Eh, uniformly higher values of uranium in lake sediments (higher compared to other playas of Rajasthan) and concentration of very high SO_4 values still exists.

This small article provides an insight into this thinking process which is an amalgamation of known geological and geochemical data, a dream to locate a world class uranium deposit in India and regulated imagination.

My dear youngsters, keep your dreams alive for the Organisation and come out with outstanding results.

Wishing you all the very best !

पूर्वी भारत के यूरेनिफेरस क्वार्टज गुटिका संगुटिकाश्म- सिंहावलोकन एवं प्रेक्षण

URANIFEROUS QUARTZ PEBBLE CONGLOMERATES OF EASTERN INDIA - OVERVIEW AND OBSERVATIONS

बृदांवन मिश्र **BRUNDABAN MISHRA**

Shri Brundaban Mishra *obtained M.Sc (Tech) (Geology) and M.Tech (Mineral Exploration) from Indian School of Mines, Dhanbad and joined AMD in 1984. He has vast experience of over 35 years and has worked in different parts of the country in various capacities. During the last decade he has contributed immensely as Incharge, Uranium Investigations in Eastern and Northeastern Regions; Deputy Regional Director and Regional Director, Western Region. He retired as Scientific Officer - H and Regional Director, Western Region on 31st March, 2019 on superannuation.*

Quartz Pebble Conglomerate (QPC) type uranium deposit is the oldest U- deposit of the world that contributes a significant part of world uranium resources. It is formed in an oxygen deficient atmospheric condition of 3.0 – 2.3 Ga before the ~ 2.2 Ga Great Oxygenation Event (GOE) at the base of thick sequence of volcanosedimentary formations of shield areas. Uranium mineralisation occurs in the form of detrital uraninite in pyritiferous matrix of QPC, often associated with gold/REE. Besides Dharwar and Aravalli Cratons, the stratigraphic succession of Singhbhum Craton of Eastern India reveals the U-QPC occurrences at the base of Iron Ore Group (IOG) and Dhanjori Group in Odisha and Jharkhand, where I was associated with exploration for QPC type uranium mineralisation over more than a decade. In Singhbhum Craton, the uraniferous QPCs are found in several basins such as (i)Sayamba, Taldih, Bagiyabahal in Noamundi-Koira Basin, (ii) Ramachandrapur in Moloygiri-Bankhal Basin, (iii) Dhosra Parbat, Lohasila and Turliga Parbat in Gorumahisani- Badampahar Basin, (iv) Mankarhachua, Timi in Mankarhachua Basin,(v) Hadagarh in Notopahar Basin, (vi) Balia, Rankia, Pimpudia,Talangi in Mahagiri Hill of Daitari Basin and (vii) Chaidiha, Jawardihi, Rainidih, Barunia, Phuljhari, Chakri, Tirioburu, Asthakaoli, Chandanpahar, Ichakuti, Pondakocha and Bhutgora in Dhanjori Basin. These U-QPCs are composed of pebbles of quartz and rare quartzite embedded in pyritiferous siliceous/chloritic matrix with detrital uraninite. Detailed sedimentological and facies analyses for reconstruction of depositional setting, trace and REE analyses for understanding their provenance and tectonics remain to be studied in many basins. Integrated sedimentological, geological, structural and stratigraphic studies help in their exploration.

Such integrated studies of uranium bearing Mahagiri QPC of Mahagiri synform, Daitari Basin along southern margin of Singhbhum Craton, revealed many characteristics of QPCs. Limited drilling showed continuity of mineralisation with detrital uraninite up to 280m depth. Facies association revealed proximal to distal alluvial fan depocentre for the QPC–bearing intervals in lower part of Mahagiri succession. The northern limb of the Mahagiri synform represent more proximal depositional setting and suggest

a southerly palaeoslope. The radioactive Talangi QPC bed in northern limb, being proximal part of the alluvial fan facies, may be promising potential target for detrital uraninite in Mahagiri QPCs. Mid- fan to marine reworked fan delta associations with resedimented proximal fan deposits may also host uraninite palaeoplacers (Balia-Rankia-Pimpudia area) in southern limb of Mahagiri synform.

Petrographic study of Mahagiri QPC indicate their derivation from a craton interior to recycled orogen provenance where major and trace element composition imply primarily passive margin tectonic setting with sources from both craton and recycled components of greenstone belt enclaves. Their REE signature support a differentiated upper crustal source for the sediments. Uraninite with higher Th content and REE signatures indicate their derivation from high temperature magmatic source with negative Eu – anomaly. These proxies of Mahagiri QPCs favour palaeoplacer uranium mineralisation that could be useful for uranium exploration. Such type of studies may also be useful for U-QPC exploration in other basins also.

कडप्पा बेसिन एवं उसके निकटवर्ती क्षेत्र, तेलंगाना एवं आन्ध्र प्रदेश में नए यूरेनियम अन्वेषण लक्ष्य

NEW URANIUM EXPLORATION TARGETS IN CUDDAPAH BASIN AND ADJOINING AREAS, TELANGANA AND ANDHRA PRADESH

पी.सी. पंत P.C. PANT

Shri P.C.Pant *obtained M.Sc. (Geology) from Garhwal University, Shrinagar, Uttarakhand and joined AMD in 1988. He has a vast experience of over 32 years and has worked in different parts of the country in various capacities. During last decade, he has immensely contributed as Head, Planning & Management Services Group, Atomic Minerals Data Centre and Geotechnical Investigations; Deputy Regional Director and Regional Director, South Central Region. Shri Pant retired as Scientific Officer-H and Regional Director, South Central Region, AMD on 31st December, 2019 on superannuation.*

In the early 1990's, significant uranium mineralisation was recorded in the northern part of Cuddapah Basin along the unconformity between Mahabubnagar Granite and Srisailam Formation of Cuddapah Supergroup. Since then, exploration efforts by AMD, in northern part of Cuddapah Basin, have established four unconformity related uranium deposits.

Recently, limited sub-surface exploration in Gulcheru quartzite of Papaghni Group at Kappatralla, Kurnool district, Andhra Pradesh, indicated small tonnage uranium deposit, proximal to the unconformity with basement granite. Uraninite has been identified as uranium phase in Gulcheru quartzite, which is pebbly, feldspathic and ferruginous with intercalation of carbonaceous, purple and greenish grey shale. In the adjoining area, sub-surface exploration has also established uranium mineralisation in the fracture zones filled by chlorite, haematite and sericite within basement grey granite, with several pegmatite and aplite injections.

In the central part of the Cuddapah Basin, Kurnool sediments are in contact with Nallamalais and are cross cut by the N-S trending Rudravaram lineament; manifested in the form of a reverse fault/thrust. Besides, occurence of several cross-cutting faults across the lineament makes the contact between Kurnool-Cumbum and Bairenkonda-basement granite highly favourable for unconformity related uranium mineralisation. In Palnad Sub-Basin, Kurnool Group, mainly the Banganapalle Quartzite at unconformity with basement granites, indicated good mineralisation over a considerable strike length at Sarangapalli area in Andhra Pradesh. Uraninite, coffinite and coffinitised uraninite are recorded as veins associated with pyrite. Similarly the Pakhal Basin also holds potential for unconformity related uranium mineralisation as the basal conglomerate and basement granitoids have recorded significant surface uranium mineralisation.

Several linear bodies of leucogranites intrusive into tonalitic Peninsular Gneissic Complex, occurring parallel to Gadwal Schist Belt, in Mastipuram area, Wanaparthy district and intrusive younger granite at Dindi, Achampet district, Telangana; Nelibanda and Lakkasagaram, Kurnool district, Andhra Pradesh hold potential for granite related/ disseminated type uranium mineralisation. Uraninite and gummite are identified as main uranium phases.

The prominent E-W tectonic feature cutting across the entire Cuddapah Basin and extending over 90km with about 800m width, known as Gani-Kalva Fault (GKF) is important for exploring vein type uranium mineralisation. The eastern margin of Cuddapah Basin having a number of granite bodies outcropping within the Nallamalai Group in Guntur district and granite cataclasite zones at Kasturigattu, Gudargappu and Kulluru, Nellore district, Andhra Pradesh are also favorable targets for vein type uranium mineralisation.

Recent studies of borehole core indicated presence of feldspathic sandstone in the Kamthi Formation of the Gondwana Basin of Pranahita–Godavari valley which has opened this area for exploration for sandstone type uranium mineralisation.

Thus, the northern part of Cuddapah Basin and adjoining areas possess large potential for unconformity related uranium mineralisation in Papaghni, Srisailam and Palnad Sub-Basins. In addition, the concealed unconformities between Kurnool-Cumbum and Bairenkonda-basement granite has huge potential and needs to be explored based on geophysical inputs and deep drilling concept. Altogether, the Cuddapah Basin is an established uranium province in India, which needs attention and exploration inputs to prove more uranium resources required for the nuclear power programme of the country.

एक सफल ड्रिलिंग इंजिनियर बनने के लिए पांच मंत्र

FIVE MANTRAS FOR BECOMING A SUCCESSFUL DRILLING ENGINEER

ए. बी. आनंद A.B. Anand

***Shri A.B. Anand** obtained B.Tech from Jawaharlal Nehru Technological University, Kakinada and Diploma (Automobile Engineering) from Government Polytechnic, Kakinada and joined AMD in 1983. He has vast experience of over 36 years and has worked in different parts of the country in various capacities. During the last decade he has contributed immensely as Head, Drilling Group (Departmental and Contract). He retired as Scientific Officer - H and Head, Departmental Drilling Group on 31st August, 2019 on superannuation.*

Most drilling personnel, more so in mineral exploration, do not join the profession out of liking or interest. They just end up there. It is hard work, harsh life and challenging in many ways. There's been a lot of talk lately about people wanting work-life balance. Does your job provide that? What can you do to improve the balance and how can you become successful in your profession? After being associated with the drilling profession for more than 36 years, looking back, I found myself enjoying it and thought of sharing my views about how to enjoy your profession and become a successful drilling engineer. I call them 5 mantras. They are:

KNOW AND OBSERVE: Machines used in drilling have many mechanical, automotive and hydraulic components and functions. One should have a thorough knowledge about the capacity, specifications and functions of all the assemblies of the machine. More importantly, one should know the limitations of the equipment like maximum torque, RPM and depth capacities. This will give you a clear understanding on when and where to deploy the machines. Always keep some margin for unforeseen difficulties while planning the deployment. Understand the functions of all the sub-assemblies of the machinery like prime mover, hydraulic pumps, motors, gear box, clutch etc. Study the power transmission, hydraulic circuits, and pressure, rpm settings. Keep the circuit diagrams handy at drill sites. It is always better to know everything about the machine beforehand than to regret and slog during the breakdown or emergencies. You cannot deal with an emergency situation unless you have a thorough knowledge of the process and your machinery. Understand the various drilling processes and techniques and update your knowledge regularly with the latest developments in the industry. Every drilling method has its advantages and limitations. Understand these aspects thoroughly before planning for the drilling.

LEARN AND PRACTICE: There is a vast difference between the theoretical knowledge available in the books or internet and the practical skills that are acquired by getting your hands dirty in the drill site. While the theory makes you understand the things, practical experience makes you an expert in applying the acquired theoretical knowledge to proper use. Drilling is such an operation which is not visible to the eye. One has to develop an instinct to perceive and visualise what is happening in the borehole hundreds of metres below. It is only through hands on experience that a drilling engineer will be able to understand how the borehole is behaving or likely to behave. Know what you have to drill and how you are going to drill it.

Observe the working procedures in detail at the drill site and understand why a certain adjustment is done or why a gear change is required, etc.

Start with minor jobs like holding a pipe wrench, starting a machine, assembling the core barrel, changing the bits and later move on to learn the hoisting & lowering, conducting the actual drilling operations. Experiment by making changes in drilling parameters like feed pressure, RPM, fluid flow, etc. and observing the changes in the drilling rate, bit life, deviation etc. Spend as much time as possible at the drill site and be present during the critical operations like shifting, fishing and major overhauling, etc.

CARE AND MAINTAIN: Remember the phrase "The well-oiled machine". A well maintained machine works for longer period between breakdowns and makes your job easy. Know your machine manuals like the "back of your hand". It forms a knowledge base, on which you will be able to build the foundation of your maintenance schedule and develop troubleshooting skills. Know the difference between the Preventive maintenance (schedule of planned maintenance actions aimed at the prevention of breakdowns and failures) and Predictive maintenance (techniques that help determine the condition of equipment in order to predict when maintenance should be performed).

Keep a record of all the running parameters, maintenance & breakdown details, oil changes of your machinery. Include maintenance reports in your log books. Top up and check lubricants periodically, check for signs of wear and tear. Develop a well-structured preventive maintenance schedule for your machinery.

Maintenance programmes will be successful only when you have a good spare parts management system. Classify your spares using many inventory management techniques like ABC (Based on consumption), FNSD (Based on frequency of usage: Fast moving, Normal, Slow and Dead), VED (Based on the criticality of the item: Vital, Essential and Desirable) and plan for their procurement. Maintain required spare parts in sufficient quantity to help implementing timely preventive maintenance programmes.

RECORD AND REVIEW: While it is said that each borehole is unique, studies indicate that majority of the problems and accidents in the boreholes are common. May be the strength of the problem is different between boreholes, but the problem essentially is the same. Therefore, keeping a good record of all the events, procedures, log books, performance reports, running parameters will give access to past data. One can learn from the records and plan for the corrective measures well in advance.

LIKE AND ENJOY: Roughneck is a term used for a person whose occupation is hard manual labor, but is most commonly associated with the personnel working on a drilling rig. No doubt, drilling is a tough profession. It involves many challenges and sacrifices to become a good drilling engineer. Nevertheless, let it not deter you from enjoying your job. Once you made up your mind and decided to stick to the profession, develop a liking to it. Doing what you like is luck and freedom, whereas, liking what you do is happiness and contentment. To enjoy working as drilling engineer, one must like and love the profession. Your attitude towards the profession changes dramatically once you start liking it, which in turn makes you a complete professional and you not only enjoy the work, but reap its benefits also.

परमाणु खनिज निदेशालय के भौतिकी वर्ग में रेडियोमितीय यूरेनियम अन्वेषण की तकनीकों में प्रगति

ADVANCEMENT IN RADIOMETRIC URANIUM EXPLORATION TECHNIQUES IN PHYSICS GROUP, AMD

प्रवीण कुमार शर्मा Pravin Kumar Sharma

Shri Pravin Kumar Sharma *obtained M.Sc. (Physics) from Meerut University, Uttar Pradesh and PGDSI from National Institute of Technology, Kurukshetra, Haryana. After successfully completing Training in 27th batch of BARC-Training School, Mumbai, he joined AMD during 1984. He has worked in different parts of India and contributed immensely in the development of Physics Group. He retired as Scientific Officer – H and Head Physics Group, on superannuation on 31st May, 2019.*

The Physics Group plays a very important role in atomic mineral exploration by employing radiometric techniques. Physics Group in the early fifties designed valve and Geiger Muller counter-based gamma-ray logging system which was extensively used in Singhbum, Jharkhand. By the continuous efforts along with technological advancements, NaI(Tl) scintillation probe-based gamma-ray logging system were designed and used for measurement of eU_3O_8 at ppm-level. An automatic bulk uranium ore analyser was installed at Bodal mines, Chhattisgarh in the early eighties. Modest airborne survey was started as early as 1954 with two 4" x 2" NaI(Tl) detectors with a two-channel spectrometer, one for total counts and the other for 2.62 MeV Thorium. It was felt to use large size NaI(Tl) detectors with a gamma-ray spectrometer. Three generations of Airborne Gamma-Ray Spectrometer (AGRS) were designed and deployed over time viz. TTL, CMOS and notebook PC based high sensitivity Airborne Gamma-Ray Spectrometer (AGRS) with the detection limit of 1ppm eU in presence of 4ppm eU, 2ppm eTh in presence of 8ppm eTh and 0.2% K in presence of 1% K with 50 litres down looking NaI(Tl) detectors and 8 litres up looking NaI(Tl) detectors.

Since the inception of gamma ray logging of boreholes, calibration of the borehole logging system was started with 4ftx4ft cylindrical uranium standard in the early fifties for directly assessing the grade in terms of eU_3O_8.The model borehole with three radioactive zones was constructed at Jaduguda Mine, Jharkhand. In order to calibrate the spectral gamma-ray bore logging system, three primary boreholes viz. K, U, and Th were constructed at Hyderabad in 1984. There was a need to construct transportable calibration boreholes to meet the requirement of calibration of spectral borehole logging calibration system in the Region itself. One such set of transportable calibration boreholes was constructed in 2018 at Central Region, Nagpur. The Physics Group constructed calibration pads for calibration of portable and airborne spectrometer at Civil Airport, Nagpur in the year 1984. Two sets of transportable calibration pads were constructed at Central Region, Nagpur. The creation of this new calibration facility has resulted in substantial saving to the government exchequer by eliminating the need for the calibration pads at airport.

In X plan, laboratories were upgraded with the state of art

DSP based gamma-ray spectrometers which minimise the downtime of the systems to almost zero. In the XI plan three laboratories were equipped with 30% relative efficiency HPGe detectors. The HPGe detector with 50% relative efficiency is installed in the Western Region, Jaipur. These high-resolution detectors with DSP based MCA routinely confirms the content of uranium in the samples in presence of very high thorium (more than 10 times of uranium) which is not possible with the Beta/ Gamma Method with reliability. The latest HPGe detector (160% relative efficiency) coupled with DSP based gamma ray spectrometer was installed at RSA Laboratory, Headquarters recently.

An alpha spectrometry facility is set up at RSA Laboratory, Hyderabad for studying the isotopes. Most important part of alpha spectrometry of equilibrium/disequilibrium studies is to determine U_{234}/U_{238}, Th_{230}/U_{238} activity ratios as well as the determination of U_{238} and Th_{232} in rock/water samples. These estimations are very important in uranium hydrological surveys and dating of younger rocks viz. calcretes.

Physics Group has contributed in the BRNS project for radon mapping of the country coordinated by HS&E Group, BARC. Radon/thoron and their progeny were measured in Central India under the project. Physics Group also convened IGCP -571 project “Radon, Health and Natural Hazard”. A radon laboratory is also set up to measure the radon/thoron and their progeny in soil, water and environment, employing both active and passive techniques at RSA, Laboratory, Hyderabad.

The Instrumentation Neutron Activation Analysis (INAA) laboratory, Hyderabad is having HPGe detector (Co-axial/ planer semiconductor detectors coupled with DSP based multi-channel analysers). This laboratory provides elemental concentrations of major, minor and trace elements viz. Na, K, Ca, Sc, Cr, Fe, Co, Cu, Zn, Ga, As, Br, Zr, Ag, Au, Sb, Cs, Ba, REE, Hf, Ta, W, Th and U in the diverse matrix in percent to trace level.

The Physics Group with continuous upgradation process will continue to make advancements in the analytical facilities and strive hard to accomplish the vision of Directorate for exploration of atomic minerals.

प ख नि में मेरी यात्रा
MY JOURNEY IN AMD

एस.बी. सिंह S.B. SINGH

***Shri S. B. Singh** obtained M.Sc. (Inorganic Chemistry) from Mahatma Jyotiba Phule Rohilkhand University, Bareilly, Uttar Pradesh and PGDIM from National Institute of Technology, Nagpur and joined AMD in 1981. He has over 38 years of experience in the field of analytical chemistry and has worked in many parts of the country. He retired as Scientific Officer-G and Head, Chemistry Group on 31st August, 2019 on superannuation.*

I joined AMD in the year 1981 as Scientific Officer after obtaining M.Sc. Degree in Inorganic Chemistry. Since then, I worked in different Chemistry laboratories and gained experience of over 38 years in chemical characterisation of atomic minerals for estimation of over 60 elements using state of the art advanced instrumental techniques like ICP-MS, ICP-OES, Flame/GF/HR-CS-AAS, Ion Chromatography, Fluorimetry (Pellet & Laser induced / LED), etc. and management of AMD laboratories.

I was associated with development of field oriented analytical procedures and novel sample decomposition methods for exploration of atomic minerals. As a field geochemist, I have worked in mobile geochemical laboratory for more than one third of my career in different parts of the country and provided on-the-spot analysis of various geological materials for uranium exploration programme of AMD.

Chemistry Laboratory, Hyderabad obtained renewal of accreditation from NABL in accordance with ISO/IEC 17025: 2005 standard in the discipline of chemical testing for two more years from 22.04.2018 to 21.04.2020.

Apart from providing highly accurate and precise analytical data, I was also actively involved in development of need based Research and Development work. It included development of new analytical methods and improvement in the existing methods in terms of accuracy, sample throughput, removal of interferences, standardization of optimum parameters, etc., for determination of As, Cr, Pb in titanium pigments; Hg in geological materials by CMA-ICP-OES; development of new and sensitive spectrophotometric reagents for determination of V, Th, Ce, Zr, Cr, Si, P, etc. Rhenium was analysed for the first time in AMD by developing rapid decomposition method.

At present Chemistry Group is equipped with modern instrumental techniques and there is still a need to upgrade further with HR-ICP-MS & LA-MS for determination at ultra trace levels.

I wish Chemistry Group to achieve newer heights in Research and Developmental work to meet the future challenges.

स्वतंत्रता दिवस समारोह INDEPENDENCE DAY CELEBRATIONS

The 73rd Independence Day was celebrated with great fervour in AMD Headquarters, Regional Centres and in the field camps. Glimpses of the celebrations are presented below:

मुख्यालय Headquarters

On the 73rd Independence Day, **Shri M. B. Verma,** the then Director, unfurled the National Flag and received the guard-of-honour in AMD, Hyderabad. In his address, he briefed about the activities and achievements of AMD during the year. He also emphasised for contributions from each and everyone for the growth of the organisation. This was followed by a colourful cultural programme organised by AMD Recreation Club, Hyderabad.

क्षेत्रीय मुख्यालय Regional Headquarters

Southern Region, Bengaluru

Eastern Region, Jamshedpur

Central Region, Nagpur

Western Region, Jaipur

Northeastern Region, Shillong

South Central Region, Hyderabad

Field Camp T. Sundupalle, SR

70 वां प ख नि - वार्षिक दिवस समारोह 70th AMD - ANNUAL DAY CELEBRATIONS

The 70th Annual Day celebrations of AMD were held on 29th July, 2019 at Headquarters, Hyderabad. The function was attended by many retired employees of AMD. **Dr. U. Kamachi Mudali,** Chairman and Chief Executive, Heavy Water Board (HWB) and **Rear Admiral (Retd.) Sanjay Chaubey,** Chairman and Managing Director, Electronics Corporation of India Limited (ECIL) graced the occasion as Chief Guests. **Shri M.B.Verma,** the then Director, AMD presided over the function and briefed the audience about the achievements of AMD during the last one year and expressed desire for better performance in the years to come with the blessings of elders and active involvement of the employees.

Dr. U Kamachi Mudali, delivered the foundation day lecture on the activities of Heavy Water Board. The Rolling Trophies for the best performing drilling units for the year 2017-18 were distributed during the celebrations. The trophies were presented to Drilling Unit Incharges and Senior Technicians by **Dr. U. Kamachi Mudali,** CE, HWB and **Rear Admiral (Retd.) Sanjay Chaubey,** CMD, ECIL. The programme concluded with colourful cultural events by in-house talents.

The profiles of the best performing drilling units are as follows.

Best performing drilling units - Rolling Trophy for 2017-18

Mechanical Rig Category (3 trophies for best performance among 23 rigs)

First Prize: DM 400 (4) deployed in Kaladgi Basin Investigations, Southern Region. **Shri Shriramachandra** (late) / **Shri Bittu Kumar Mondal,** Incharge, along with his crew members achieved a drilling progress of 2,408m against the target of 2,100m. Congratulations!

Second Prize: RD 60 (5) deployed in Surguja Investigations, Central Region. **Shri Gautam Karmokar,** Incharge along with the crew members achieved a progress of 2,262m against the target of 2,000m. Congratulations!

Third Prize: RD 60 (3) deployed in Surguja Investigations, Central Region. **Shri Gautam Karmokar,**Incharge along with the crew members achieved a progress of 2,212m against the target of 2,000m. Congratulations!

Hydrostatic Rig Category (2 trophies for best performance among 12 rigs)

First Prize: WA IIIC (4) deployed in Singhbhum Shear Zone Investigations, Eastern Region. **Shri S.C. Das,** Incharge along with the crew members achieved a progress of 5,004m against the target of 3,900m. Congratulations!

Second Prize: HDCD-400(6) deployed in Southern Cuddapah Basin Investigations, Southern Region. **Shri N. Venkatesh Babu,** Incharge along with the crew members achieved a progress of 4,466m against the target of 3,800m. Congratulations!

Glimpses of AMD – Annual Day Celebrations in Regional Headquarters

Northern Region

Central Region

Eastern Region

Northeastern Region

Southern Region

Western Region

पखनि में गणमान्य व्यक्तियों का दौरा VISIT OF DIGNITARIES TO AMD

Shri K.N. Vyas, Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy visited Central Region, Nagpur on 14th January, 2019 and held technical discussions with the Scientific Officers on the activities of Central Region and exploration status.

Shri M.A. Inbarasu, the then Joint Secretary (I&M) visited AMD, Hyderabad on 8th March, 2019, where he got acquainted with the laboratory facilitices in Headquarters and interacted extensively with the Scientific Officers.

Dr. A.K. Mohanty, Director, Bhabha Atomic Research Centre, Mumbai visited Headquarters Hyderabad on 11th November, 2019. He visited the laboratories in Headquarters and interacted extensively with the Scientific Officers.

Smt. Sudha Krishnan, Secretary to Government of India and Member Finance, Department of Atomic Energy visited Headquarters on 31st May, 2019. She visited the laboratories in Headquarters and interacted extensively with the Scientific Officers.

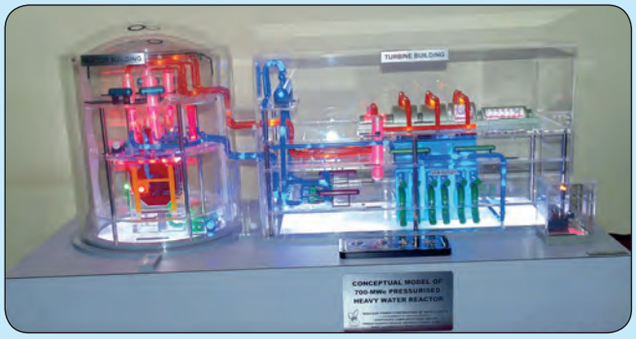
Dr. Dinesh Srivastava, Chairman and Chief Executive, Nuclear Fuel Complex (NFC), Hyderabad visited Rohil area, Sikar District, Rajasthan during 12-13 October, 2019. Uranium exploration activities in Rajasthan were explained to him.

Dr. A.K. Mohanty, Director, Bhabha Atomic Research Centre, visited BSOI office, Visakhapatnam on 22nd May, 2019. Beach Sand Investigations in the states of Andhra Pradesh and Odisha were explained to him.

मध्यवर्ती क्षेत्र में संस्थापित नाभिकीय रिएक्टर का मॉडल

MODEL OF NUCLEAR REACTOR INSTALLED IN CENTRAL REGION

The semi-dynamic model of 700 MW Nuclear Power Plant (NPP) has been installed at Central Region, Nagpur, on 1st October 2019. The semi-dynamic model comprises Reactor and Turbine building in 1:200 scale. This model will be used for various public awareness activities of AMD.



Over the years, the semi-dynamic NPP models have proved to be one of the best tools to educate / inform general public about nuclear power plant operation. The concept of miniature NPP model takes the ease of information sharing to a new level through stunning liveliness, interactivity and relevant synchronised voice narration that accompanies the information delivery. The see-through construction of the model allows the viewer to have a peek inside the reactor itself. The model explains the functioning of a nuclear power plant in a simple and interesting manner with running commentary on various conventional as well as nuclear systems while the corresponding sections of the model light up to add dynamism to the presentation. Various nuclear safety features are also included in the model.

राजभाषा समाचार

पखनि ने वर्ष 2019 के दौरान राजभाषा कार्यान्वयन के क्षेत्र में कई उपलब्धियां प्राप्त कीं, जिनमें निम्नलिखित प्रमुख हैं :

पखनि मुख्यालय, हैदराबाद में राजभाषा कार्यान्वयन के प्रति सक्रियता बनाए रखने के उद्देश्य से प्रतिवर्ष की भांति अनेकानेक कार्यक्रमों का आयोजन किया गया। वर्ष 2019 के दौरान जनवरी में विश्व हिन्दी दिवस, हिन्दी में लोकप्रिय व्याख्यानों एवं कार्यशालाओं का आयोजन किया गया। सितंबर माह में हिन्दी पखवाड़े का सफल आयोजन किया गया। राजभाषा कार्यान्वयन समिति की नियमित बैठकें आयोजित की गईं।

- निदेशालय को उत्कृष्ट कार्य हेतु पऊवि की राजभाषा शील्ड से सम्मानित किया गया तथा गृहपत्रिका खनिज भारती को सांत्वना पुरस्कार प्रदान किया गया।
- पखनि मुख्यालय, हैदराबाद को राजभाषा कार्यान्वयन के क्षेत्र में उत्कृष्ट कार्य करने हेतु नगर राजभाषा कार्यान्वयन समिति-4 की इस वर्ष की राजभाषा शील्ड व गृहपत्रिका खनिज भारती को सर्वश्रेष्ठ पत्रिका शील्ड से सम्मानित किया गया।
- हर साल की भाँति इस वर्ष भी दो वैज्ञानिक संगोष्ठियों का आयोजन किया गया।
- दक्षिण मध्यवर्ती क्षेत्र, चर्लापल्ली में 06-07 फरवरी, 2019 के दौरान "परमाणु खनिज संसाधन : अन्वेषण, अनुसंधान एवं आधुनिक प्रौद्योगिकी में योगदान" विषय पर तथा पश्चिमी क्षेत्र, जयपुर में 30 सिंतबर व 01 अक्तूबर 2019 को "अरावली क्रेटान: खनिज अन्वेषण एवं भविष्य की संकल्पनायें" विषय पर दो दिवसीय हिन्दी वैज्ञानिक संगोष्ठी का आयोजन किया गया।

मुख्यालय, हैदराबाद

पखनि मुख्यालय, हैदराबाद में राजभाषा कार्यान्वयन के क्षेत्र में राजभाषा कार्यान्वयन समिति और हिन्दी अनुभाग द्वारा सतत् प्रयास जारी है ताकि दिन प्रतिदिन कार्यालयीन कार्य में कार्यान्वयन सुचारू रूप से आगे बढ़े। इस दिशा में, इस वर्ष आयोजित हिन्दी कार्यशालाओं में 64 अधिकारियों एवं 79 कर्मचारियों को प्रशिक्षित किया गया। हिन्दी शब्द संसाधन प्रशिक्षण के अंतर्गत 18 कर्मचारियों को भी प्रशिक्षित किया गया।

प्रत्येक वर्ष की भाँति इस वर्ष भी दिनांक 10.01.2019 को विश्व हिन्दी दिवस का आयोजन किया गया। इस अवसर पर श्री पीयूष सोनकर, आयकर आयुक्त, हैदराबाद मुख्य अतिथि के रूप में आमंत्रित थे। श्री पीयूष सोनकर ने "टैक्सेशन" विषय पर व्याख्यान प्रस्तुत किया।

सितंबर माह में हिन्दी पखवाड़े का सफल आयोजन किया गया। इस अवसर पर मुख्य अतिथि के रूप में डॉ. रवि रंजन, प्रोफेसर, हिन्दी विभाग, हैदराबाद विश्वविद्यालय को आमंत्रित किया गया । हिन्दी पखवाड़े में 13 प्रतियोगिताओं का सफल आयोजन किया गया, जिसमें कुल 261 प्रतिभागियों ने भाग लिया और 156 प्रतिभागियों को पुरस्कार प्रदान किए गए। इस अवसर पर श्वेत पटल लेखन प्रतियोगिता के तहत उत्तम प्रस्तुति के लिए तकनीकी वर्ग में क्ष-किरण विवर्तन प्रयोगशाला को प्रथम पुरस्कार, क्ष-किरण प्रतिदीप्ति प्रयोगशाला एवं योजना एवं प्रबंधन सेवा वर्ग को द्वितीय पुरस्कार से सम्मानित किया गया। वैज्ञानिक एवं तकनीकी संसाधन केंद्र को विशेष पुरस्कार एवं गैर - तकनीकी वर्ग में प्रशासनिक अधिकारी-III के कार्यालय को प्रथम पुरस्कार से सम्मानित किया गया।

दिनांक 15.11.2019 से 19.11.2019 के दौरान पखनि परिसर, हैदराबाद में परमाणु ऊर्जा विभाग के 20वें अखिल भारतीय राजभाषा सम्मेलन का सफल आयोजन किया गया। इस कार्यक्रम के मुख्य अतिथि डॉ. दामोदर खडसे, सदस्य, हिन्दी सलाहकार समिति प.ऊ.वि.; श्री संजय कुमार, संयुक्त सचिव (प्रशा. एवं लेखा), प.ऊ.वि, रिअर एडमिरल संजय चौबे, अध्यक्ष एवं प्रबंध निदेशक, ई.सी.आई.एल.; प्रोफसर सुधाकर पांडा, निदेशक, नाईजर; डॉ. कल्लोल रॉय, अध्यक्ष और प्रबंध निदेशक भाविनि आदि उपस्थित थे। श्री एम.बी.वर्मा, तत्कालीन निदेशक, पखनि ने स्वागत संबोधन प्रस्तुत किया । रिअर एडमिरल संजय चौबे एवं प्रोफेसर सुधाकर

पांडा, निदेशक, नाईजर ने सभा को संबोधित किया। इस अवसर पर राजभाषा हिन्दी में उत्कृष्ट कार्य करने वाली इकाइयों/उपक्रमों/सहायता प्राप्त संस्थानों को वर्ष 2018-19 के लिए राजभाषा शील्ड प्रदान की गई और राजभाषा हिन्दी में प्रकाशित सर्वश्रेष्ठ गृह पत्रिकाओं

को पुरस्कृत किया गया।

वर्ष 2018-19 के लिए राजभाषा हिन्दी के क्षेत्र में उत्कृष्ट एवं रचनात्मक कार्य में योगदान देने वाले पदाधिकारियों को राजभाषा भूषण एवं हिन्दी सेवी सम्मान पुरस्कार प्रदान किया

गया। जिसके तहत डॉ. एस.एन.चतुर्वेदी, वैज्ञानिक अधिकारी/एच को राजभाषा भूषण पुरस्कार और डॉ. राजीव बिडवई, वैज्ञानिक अधिकारी/एच एवं श्री जी.एन. हेगड़े, वैज्ञानिक अधिकारी/जी को हिन्दी सेवी सम्मान से सम्मानित किया गया।

इस अवसर पर पखनि मुख्यालय, हैदराबाद को राजभाषा कार्यान्वयन के क्षेत्र में उत्कृष्ट कार्य करने हेतु प्रथम स्थान स्वरूप पऊवि की राजभाषा शील्ड व गृहपत्रिका खनिज भारती को सांत्वना पुरस्कार प्रदान किया गया। इसके बाद अतिथिवक्ता डॉ. दामोदर खडसे ने अपना व्याख्यान प्रस्तुत किया। श्री अचलेश्वर सिंह, संयुक्त निदेशक (राजभाषा) ने धन्यवाद ज्ञापन प्रस्तुत किया।

इस क्रम में दिनांक 15.11.2019 को दोपहर 1400 बजे संयुक्त राजभाषा कार्यान्वयन समिति की बैठक का आयोजन किया गया जिसमें पऊवि की सभी इकाइयों/उपक्रमों/सहायता प्राप्त संस्थानों की रा.भा.का.समिति के अध्यक्षों एवं हिन्दी अधिकारियों ने भाग लिया। दिनांक 17.11.2019 को सभी हिन्दी अधिकारियों हेतु कार्यशाला का आयोजन किया गया।

दिनांक 20.11.2019 को पखनि मुख्यालय, हैदराबाद में नगर राजभाषा कार्यान्वयन समिति-4 (कें.स.का.) वर्ष 2019 की दूसरी बैठक का सफल आयोजन निदेशक, पखनि की अध्यक्षता में किया गया। इस अवसर पर पखनि मुख्यालय, हैदराबाद को राजभाषा कार्यान्वयन के क्षेत्र में उत्कृष्ट कार्य करने हेतु नगर राजभाषा कार्यान्वयन समिति-4 की इस वर्ष की राजभाषा शील्ड व गृहपत्रिका खनिज भारती को सर्वश्रेष्ठ पत्रिका शील्ड से भी सम्मानित किया गया।

क्षेत्रीय समाचार

पूर्वोत्तर क्षेत्र, शिलांग

पखनि, पूर्वोत्तर क्षेत्र, शिलांग में वर्ष 2019 के दौरान हिन्दी प्रचार-प्रसार से संबंधित विभिन्न कार्यक्रमों का आयोजन किया गया तथा

विश्व हिन्दी दिवस, हिन्दी कार्यशालाओं, हिन्दी शब्द संसाधन आदि कार्यक्रमों का भी आयोजन किया गया। सितंबर माह में हिन्दी पखवाड़े का सफल आयोजन किया गया, जिसमें सभी अधिकारियों और कर्मचारियों ने उत्साहपूर्वक भाग लिया। नराकास की प्रतियोगिताओं में भी कार्यालय ने पुरस्कार प्राप्त किए। पखनि, पूर्वोत्तर क्षेत्र को नराकास द्वारा हिन्दी में उत्कृष्ट कार्य हेतु प्रशस्ति-पत्र प्राप्त हुआ। कार्यालय के कर्मचारियों ने हिन्दी टंकण एवं कंप्यूटर प्रशिक्षण सफलतापूर्वक पूरा किया।

मध्यवर्ती क्षेत्र, नागपुर

परमाणु खनिज अन्वेषण एवं अनुसंधान निदेशालय, मध्यवर्ती क्षेत्र में राजभाषा के प्रति सक्रियता बनाए रखने के उद्देश्य से प्रतिवर्ष की भाँति अनेकानेक कार्यक्रमों का आयोजन किया गया। हिन्दी दिवस, हिन्दी में लोकप्रिय व्याख्यान का आयोजन एवं कार्यशालाओं का आयोजन किया गया। सितंबर माह में हिन्दी पखवाड़े का सफल आयोजन किया गया। इस अवसर पर आयोजित विभिन्न प्रतियोगिताओं में सभी अधिकारियों एवं कर्मचारियों ने उत्साहपूर्वक भाग लिया।

पूर्वी क्षेत्र, जमशेदपुर

जनवरी में विश्व हिन्दी दिवस का आयोजन किया गया। पखनि पूर्वी क्षेत्र में सितंबर माह के दौरान हिन्दी पखवाड़े के आयोजन के क्रम में अनेक प्रतियोगिताओं का आयोजन किया गया। इस अवसर पर मुख्य अतिथि के रूप में डॉ. दीपक कुमार सिन्हा, तत्कालीन अपर निदेशक (प्रचालन-I), पखनि, हैदराबाद एवं विशिष्ट अतिथि के

रूप में डॉ. राजगोपाल महंती, अपर निदेशक(सेवानिवृत्त), पखनि उपस्थित थे। इसी क्रम में हिन्दी कार्यशालाओं का भी आयोजन किया गया।

उत्तरी क्षेत्र, नई दिल्ली

परमाणु खनिज अन्वेषण एवं अनुसंधान निदेशालय, उत्तरी क्षेत्र, नई दिल्ली में सितम्बर, 2019 में हिन्दी पखवाड़ा आयोजित किया गया। इसमें विभिन्न हिंदी प्रतियोगिताएं आयोजित की गईं जिसमें क्षेत्र के लगभग सभी अधिकारियों एवं कर्मचारियों ने बढ़-चढ़ कर भाग लिया। हिन्दी पखवाड़े के समापन समारोह एवं पुरस्कार वितरण के मौके पर श्री अशोक कुमार भट्ट, अपर निदेशक, विशिष्ट अतिथि के रुप में उपस्थित रहे। डॉ. श्यौराज सिंह बेचैन मुख्य अतिथि ने सभा को सम्बोधित किया।

पश्चिमी क्षेत्र, जयपुर

पखनि, पश्चिमी क्षेत्र, जयपुर में जनवरी में विश्व हिन्दी दिवस समारोह का आयोजन किया गया। इसके अतिरिक्त वर्ष भर में राजभाषा गतिविधियों के अंतर्गत हिन्दी शब्द संसाधन प्रशिक्षण का आयोजन किया गया। हिन्दी व्याख्यान में वक्ता के रूप में केंद्रीय भूजल बोर्ड के क्षेत्रीय निदेशक डॉ. सुनील कुमार जैन को आमंत्रित किया गया

और फील्ड क्षेत्र खण्डेला में सामुदायिक स्वास्थ्य केंद्र, खण्डेला के चिकित्सा अधिकारी डॉ.अशोक कुमार यादव को व्याख्यान हेतु आमंत्रित किया गया । इसके अतिरिक्त हिन्दी कार्यशालाओं एवं सितंबर माह में हिन्दी पखवाड़ा का आयोजन किया गया । दिनांक 30 सिंतबर व 01 अक्तूबर 2019 को जयपुर में दो दिवसीय हिन्दी वैज्ञानिक संगोष्ठी का आयोजन किया गया । संगोष्ठी के दौरान 35 आलेखों/शोधपत्रों की पुस्तिका "स्मारिका" का विमोचन निदेशक, पखनि के कर कमलों से किया गया । इसी क्रम में हिन्दी व्याख्यान का आयोजन भी किया गया ।

दक्षिण मध्यवर्ती क्षेत्र, हैदराबाद

राजभाषा कार्यान्वयन समिति की नियमित बैठकें आयोजित की गईं । हिन्दी संबंधी नेमी प्रकार के सभी आयोजन समय-समय पर किये गये, जिसमें चार कार्यशालाएं, हिन्दी दिवस तथा विश्व हिन्दी दिवस का आयोजन सम्मिलित हैं । 06-07 फरवरी, 2019 के दौरान "परमाणु खनिज संसाधन : अन्वेषण, अनुसंधान एवं आधुनिक प्रौद्योगिकी में योगदान" विषय पर क्षेत्रीय राजभाषा कार्यान्वयन समिति के तत्वावधान में दो दिवसीय वैज्ञानिक संगोष्ठी का आयोजन किया गया । दिनांक 10.01.2019 को विश्व हिन्दी दिवस मनाया गया ।

दक्षिण मध्यवर्ती क्षेत्र, चर्लापल्ली में दिनांक 16.09.2019 से 30.09.2019 तक हिन्दी पखवाड़ा मनाया गया । दिनांक 14.09.2019 से 21.09.2019 तक शिविर नारायणपुरम, शिविर आत्मकुर एवं शिविर कोडूमरु में भी हिन्दी सप्ताह मनाया गया ।

दक्षिणी क्षेत्र, बेंगलूरु

राजभाषा कार्यान्वयन समिति की नियमित बैठकें आयोजित की गईं। हिंदी सम्बंधी नेमी प्रकार के कार्यक्रमों जैसे एक दिवसीय हिंदी कार्यशाला, हिंदी शब्द संसाधन प्रशिक्षण, हिंदी दिवस तथा विश्व हिंदी दिवस का आयोजन किया गया । इस अवसर पर श्रीमती वी.लक्ष्मी, सहायक प्रोफेसर ने "साहित्य एवं विज्ञान के क्षेत्र में हिन्दी भाषा का प्रसार" और सुश्री चंदा माझी, वैज्ञानिक अधिकारी-सी, पखनि, दक्षिणी क्षेत्र, बेंगलूरु द्वारा "मैग्माटिज़्म-क्रस्ट के गठन से जुड़ी प्रक्रियाएँ, विविधता और उत्पत्तिः पापाघनी उपद्रोणी ज्वालामुखीय शैल के संदर्भ में" विषय पर व्याख्यान प्रस्तुत किए । दिनांक 08.02.2019 को लोकप्रिय व्याख्यान का आयोजन किया गया ।

दिनांक 12-25 सितम्बर, 2019 तक हिन्दी पखवाड़े का आयोजन किया गया। दिनांक 19.09.2019 को विशेष कार्यक्रम के तहत हिन्दी में वैज्ञानिक व्याख्यान आयोजित किया गया । हिन्दी पखवाड़े के दौरान पुस्तकालय में प्रापण के लिए सुझाव प्राप्त करने हेतु सामान्य पुस्तकालय में हिन्दी पुस्तक प्रदर्शनी आयोजित की गयी । दिनांक 27.08.2019 को इस कार्यालय के फील्ड यूनिट पंतनगर, बेलगांव में हिन्दी कार्यशाला आयोजित की गई ।

अंतर्राष्ट्रीय योग दिवस INTERNATIONAL YOGA DAY

5th International Yoga Day was observed in Headquarters, Regional Centres and in field camps on 21st June, 2019. Glimpses of the activities are given below.


Headquarters, Hyderabad


Northern Region


Northeastern Region


Eastern Region


Western Region


Southern Region


South Central Region


BSOI, Visakhapatnam


BSOI, Thiruvananthapuram


Central Region

स्वच्छता पखवाड़ा SWACHHATA PAKHWADA

Under the “Swachhata Action Plan”, Swachhata Pakhwada was observed in Headquarters and Regional Centres during February 16-28, 2019. Glimpses of the activities are given below.



Headquarters, Hyderabad

Eastern Region

Northeastern Region

Southern Region

Northern Region

Western Region

South Central Region

Central Region

BSOI, Thiruvananthapuram

पुरस्कार तथा सम्मान AWARDS AND RECOGNITIONS

DAE Group Achievement Award-2018 has been conferred on **Shri/Dr. B. Saravanan,** Additional Director (R&D), **Kalyan Chakrabarti,** SO-H, **D. Bhattacharya,** SO-G, **S. K. Varughese,** SO-G, **M. Rengarajan,** SO-G, **A. K. Pradhan,** SO-F, **Debasish Roy,** SO-D and **Gangai Selvam,** SA-D in recognition of their outstanding contribution in "Augmentation of uranium resource from Kanchankayi uranium deposit and its environs". The award was presented by **Dr. A.N. Prasad,** Former Director, Bhabha Atomic Research Centre (BARC) to the team leader **Shri B. Saravanan,** Additional Director on 30th October, 2019 on the occasion of BARC Founders Day celebrations at BARC, Mumbai. **Shri K.N. Vyas,** Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, **Dr. A.K. Mohanty,** Director, BARC and other dignitaries graced the occasion.

DAE Group Achievement Award-2018 has been conferred on **Shri/Dr. Ch.V.S.N. Raju,** Head, Drilling Group, **S.C. Das,** SO-E, **Jitendra Kumar Das** SA/B, **D.B. Paul,** Tech.-F, **S.A. Ali,** Tech.-D, **Babulal Kumar,** Tech.-B, **Jerom Kujur,** Work Asst.-C, **Raghunath Rai,** Work Asst.-C, **Shiv Ram Mahato,** Work Asst.-B, **Sonaram Soren** Work Asst.-B, **Koushik Biswas,** Work Asst.-A, **P. Suraj Rao,** Work Asst.-A, **Ghanshyam Majhi,** Security Guard, **Brijlal Rai,** Security Guard, **Kedar Saw,** Security Guard, **Ghasiram Soren**, Security Guard , **Triveni Yadav**, Security Guard, **Ramu Hansda,** DR GR-I, **Kailash Sharma,** DR GR-II, **Bankira Manki,** DR GR-II in recognition of their outstanding contribution in "Exploration Drilling by WA III C (4) drilling unit". The award was presented by **Dr. A.N. Prasad,** Former Director, Bhabha Atomic Research Centre (BARC) to the team leader **Shri Ch.V.S.N. Raju,** on 30th October, 2019 on the occasion of BARC Founders Day celebrations at BARC, Mumbai. **Shri K.N. Vyas,** Chairman Atomic Energy Commission and Secretary, Department of Atomic Energy, **Dr. A.K. Mohanty,** Director, BARC and other dignitaries graced the occasion.

Shri R.M. Karuppu Swamy, Sr. Tech. H, Southern Region, Bengaluru has been conferred with DAE Meritorious Service Award -2018. The award was presented by **Dr. A.N. Prasad,** Former Director, Bhabha Atomic Research Centre (BARC) on 30th October, 2019 on the occasion of BARC Founders Day celebrations at BARC, Mumbai. **Shri K. N. Vyas,** Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, **Dr. A.K. Mohanty,** Director, BARC and other dignitaries graced the occasion.

Indian Society of Applied Geochemists (ISAG) conferred the following Awards 1.**"Lifetime Achievement Award"** to **Shri M.B. Verma,** the then Director, AMD for significant contributions in the field of Mineral Exploration and 2.**"Dr. "G.R.Udas- K.K. Dwivedi Medal"** to **Shri Shekhar Gupta**, Scientific Officer-F, PMSG, AMD Hyderabad for significant

contributions in the field of geochemistry in the last 10 years. The awards were presented during the Annual General Body Meeting (AGM) of the society during 29-30 November, 2019 held in Adikavi Nannaya University, Rajahmundry, Andhra Pradesh.

Shri Kshtij Gautam, Scientific Officer-D, Central Region has been conferred with the **"Young Sedimentologist Award-2019"** instituted by the Indian Association of Sedimentologists. The award was presented during the 36th Convention of IAS held in AMD Complex, Begumpet, Hyderabad during 7-8 November, 2019.

राष्ट्रीय विज्ञान दिवस
NATIONAL SCIENCE DAY

National Science Day with the focal theme of "Science for People and People for Science" was celebrated in AMD Headquarters, Regional Centres, Sectional Headquarters and in various field camps commemorating the legacy of **Sir C.V. Raman**. Glimpses of the activities are given below:

Headquarters, Hyderabad

AMD participated in the science exhibition held in BARC, Mumbai commemorating the National Science Day during 26th February, 2019 to 1st March, 2019. AMD stall consisted of display panels on atomic mineral exploration techniques, various investigative techniques, instruments and rock samples (core and grab), atomic mineral(s) resources in the country and a video presentation. Several dignitaries including **Dr. R.K. Sinha,** Former Chairman AEC and Secretary, DAE and **Shri K.N. Vyas,** Chairman AEC and Secretary, DAE visited the AMD stall. More than 1,000 students from different schools of Mumbai and 500 scientists from the different Groups of BARC visited the AMD stall.

In AMD Complex, Hyderabad, science exhibition and quiz competition were organised on 27th February, 2019. A total of 550 students visited the exhibition. Film on AMD's exploration programme was screened for the benefit of students (both school and college), accompanying faculty and visitors. Chemistry Laboratory, Hyderabad won the most innovative display stall prize.

Northern Region, New Delhi

National Science Day was celebrated on 28th February, 2019. Students from Ram Lal Anand College, New Delhi visited Physics, Chemistry and Petrology laboratories and a science quiz was also conducted.

Southern Region, Bengaluru

National Science Day was celebrated on 28th February, 2019. The open day science exhibition in AMD Complex, Bengaluru was inaugurated by **Prof. M.G. Chandrakanth,** Director, Institute for Social and Economic Change, Bengaluru. About 600 students and faculty members from Engineering & Science colleges of Bengaluru visited the exhibition and interacted with the scientists.

Eastern Region, Jamshedpur

National Science Day was celebrated on 28th February, 2019. About 350 students and teachers from different schools and colleges of Jamshedpur attended the exhibition. Students from nine schools in Jamshedpur participated in the model making competition organised to promote scientific spirit among school children. Inter school power point presentation competition was held during


22-23 January, 2019 on the topics 'Interstellar Transport' and 'Ultimate of Internet' in which 38 students from 20 schools of Jamshedpur participated. A popular lecture on "Science for People and People for Science" was delivered by **Dr. Soumitra Tarafder**, Scientist, National Metallurgical Laboratory (NML), Jamshedpur.

Western Region, Jaipur

National Science Day was celebrated on 28th February, 2019. More than 150 students of Jaipur from IIS University, SS Jain Subodh Degree College, Pariskar College of Excellence, Maheshwari College of Commerce and Arts, Jagannath Gupta Institute of Engineering and Technology and Poddar International College participated in the science exhibition.

Central Region, Nagpur

As part of National Science Day, exhibitions and competitions for the students of different schools were organised during February, 2019 in the field camps in Betul district, Madhya Pradesh; Rajnandgaon, Balarampur, Jashpur and Surajpur districts, Chhattisgarh and Jharsuguda district, Odisha. More than 3,000 students participated in the exhibitions and associated events. A power point presentation competition on 'Nuclear Energy, Clean and Green Energy' on 14th February, 2019 and an

open exhibition on 15th February, 2019 were organised in AMD Complex, Nagpur for students from schools in and around Nagpur. About 600 students from ten schools participated in the events. An Invited lecture by **Dr. A.V. Peshve**, Principal, M.P. Deo Memorial Science College, Dharampeth was organised on 28th February, 2019.

South Central Region, Hyderabad

National Science Day was celebrated on 28th February, 2019 in Cherlapally campus. About 120 students and 7 faculty members from schools of Hyderabad namely St. Mary Vidyaniketan High School, Pragnapur, St. Peters High School, Nagaram and Pudami School, Nagaram visited the exhibition and competions.

BSOI, Thiruvananthapuram

National Science Day was celebrated on 28th February, 2019. Eminent Scientist, **Dr. K.P. Raghunatha Menon**, Director, Kerala State Remote Sensing and Environment Centre (KSREC) graced the occasion and delivered a lecture on "Science for People and People for Science". Students from Chinnamma Memorial Girls Higher Secondary School, Poojappura, Thiruvananthapuram visited the laboratory facilities of BSOI, Thiruvananthapuram.

जनजागरूकता कार्यक्रम
PUBLIC AWARENESS PROGRAMME

Headquarters, Hyderabad

Exhibitions were conducted at BARC, Mumbai during 11-12 May, 2019 on the occasion of National Technology Day Celebrations and 31st January to 2nd February, 2019 on the occasion of BRNS Conference on "Indigenous Fuel Programme in India - Achievements, Status and Prospects". A total of 3,000 students and 250 delegates visited the AMD stall. An exhibition was organised on the occasion of Vikram Sarabhai Centenary Celebrations held in National Remote Sensing Centre, Hyderabad during 14-17 October, 2019. A total of 1,000 visitors comprising students from various districts of Telangana, faculty, officer trainees of Armed Forces and scientists visited the AMD stall.

Exhibitions were conducted in AMD Complex during the visit of Hon'ble Vice President of India on 16th May, 2019; AMD Annual Day on 29th July, 2019; National Seminar on Sedimentation, Tectonics, Mineral Resources and Sustainable Development organised by Indian Association of Sedimentologists during 7-8 November, 2019; Orientation and awareness visit of Telangana state leaders during September, 2019 and in XVII Mineral Processing Technology Conference held in Hyderabad during 16-18 December, 2019.

Northern Region, New Delhi

An exhibition was conducted in Lovely Professional University, Phagwara, Jalandhar, Punjab during 3-7 January, 2019 on the occasion of 106th Science Congress. Several dignitaries including **Dr. Harsh Vardhan**, Hon'ble Minister, Science & Technology, Government of India visited the AMD stall. Students of the university visited AMD stall in large numbers.

Southern Region, Bengaluru

A public awareness programme was organised in Deshnur Prospect, Camp: Pant Nagar, Belagavi district, Karnataka during 10-12 January, 2019. A science exhibition was also organised at Govindram Seksaria Science College, Belagavi, Karnataka. More than 500 students and faculty members from various schools and colleges visited the exhibition.

Eastern Region, Jamshedpur

A public awareness programme was organised in New People's Academy Public School, Jamshedpur on 5th Janauary, 2019. AMD Exhibition was visited by several dignitaries including **Shri Bidyut Baran Mahato**, Hon'ble Member of Parliament, Jamshedpur. He held

a long interaction with AMD officials in the exhibition.

Western Region, Jaipur

A public outreach programme in association with Geological Survey of India was conducted in Eklavya Model Residential English Medium School, Kanwat, Ambadongar district, Chhota Udepur, Gujarat on 23rd January, 2019. Lectures on "Benefits of Atomic Energy", "Exploration of Atomic Minerals" and "Atoms in the Service of Nation" by AMD Scientists and "Activities of GSI in different exploration areas" by **Shri Bijoy Das**, Geologist, GSI were delivered on the occasion.

Western Region participated in the exhibition conducted by Public Awareness Division (PAD), DAE in Rajasthan Atomic Power Station, Rawatbhata during the Fourth Journalist's Workshop in collaboration with the National Union of Journalists (NUJ), School of Journalism during 5 – 9 August, 2019. Journalists from various print and electronic media across Northern India visited the AMD stall and interacted with officers. Students and faculty of St. Wilfred's College, Jaipur visited Western Region office and laboratories on 5th November, 2019.

Central Region, Nagpur

Central Region participated in "Science Expo 18" held in Raman Science Center, Nagpur during 16-20 January, 2019. More than 60,000 students visited AMD pavilion. **Shri Suresh Kumar**, Regional Director, CR attended the programme as Chief Guest at the closing ceremony and delivered a lecture on "Uranium exploration for nuclear power programme" under popular science lecture series.

Central Region participated in the exhibition organised by

BARC, Mumbai in M.P Deo Memorial Science College, Nagpur during 14-15 January, 2019. A lecture on 'Uranium and nuclear energy' was delivered.

South Central Region, Hyderabad

Public awareness programmes were conducted in Ushodhaya High School, Yerragunta, Kurnool district, Andhra Pradesh on 27th February, 2019; G.V.R Zilla Parishad High School, Kodumur, Kurnool district, Andhra Pradesh on 25th February, 2019; Mandal Parishad High School, Mastipuram, Wanaparthy district, Telangana and Durga Public School, Dachepalle, Guntur district, Andhra Pradesh on 28th February, 2019. Students, teachers and general public in large numbers attended the programmes.

Sectional Office, Visakhapatnam

A public awareness programme was conducted in the office premises to commemorate AMD Annual Day on 29th July, 2019. A total of 100 students and teachers from Little Angels School, Visakhapatnam attended the programme. They visited the museum (Beach Sand Exploration), exhibits (uranium and thorium exploration), audio-visual room (AMD activity, BARC technology on Biogas plant and other audio-visuals) and NPCIL stall (Reactor models, power point presentation on nuclear energy scenario in India).

सतर्कता जागरूकता सप्ताह VIGILANCE AWARENESS WEEK

Vigilance Awareness Week with the focal theme on "Integrity – A way of Life" was observed in Headquarters and Regional Centres during 28th October, 2019 to 2nd November, 2019. An integrity pledge was taken by all the employees in Headquarters, Regional Centres and Field Units on 28th October, 2019. In Headquarters, Hyderabad various competitions likes slogan writing / cartoon / poster making competition, etc., on the focal theme were conducted for all the employees. An essay writing competition on "Integrity – A way of Life" was conducted for the students of Little Scholar School, Sanathnagar, Hyderabad. Students and teachers of Little Scholar School also took the integrity pledge. A guest lecture by **Dr. S.R. Basir,** Director (Geology) and Vigilance Officer, Geological Survey of India, Hyderabad on the topic "Good Governance" was arranged.

In Western Region, various competitions such as essay writing, elocution, slogan, etc. and a guest lecture by **Dr. C.B. Sharma**, IPS (Retd.) were arranged.

In Northeastern Region, various activities such as essay, elocution and slogan competitions and a guest lecture were arranged.

In South Central Region, various lectures on vigilance related topics were delivered.

शीर्ष अन्वेषण एवं अनुसंधान सलाहकार समिति का पुनर्गठन

RECONSTITUTION OF APEX EXPLORATION AND RESEARCH ADVISORY COMMITTEE (AERAC)

1.	Director, AMD, Hyderabad	Chariman
2.	Chairman and Chief Executive, NFC	Member
3.	Chairman and Managing Director, UCIL	Member
4.	Additional Director General, (Geology), GSI, Kolkata	Member
5.	Director, NGRI, Hyderabad	Member
6.	Shri S.C. Verma, Regional Director (Retd.), AMD	Member
7.	Dr. M.S. Pandian, Professor and Head, Dept. of Earth Science, Pondicherry University, Puducherry.	Member
8.	Prof. Shalivahan Srivastava, Head, Dept. of Applied Geophysics, ISM, Dhanbad	Member
9.	Additional Director (Op.I), AMD, Hyderabad	Member
10.	Additional Director (Op.II), AMD, Hyderabad	Member
11.	Additional Director (Op.III), AMD, Hyderabad	Member
12.	Additional Director (R&D), AMD, Hyderabad	Member
13.	All Regional Directors of AMD	Permanent Invitees

संक्षिप्त समाचार NEWS IN BRIEF

A lecture / demonstration on "Soil Health to Human Health" was delivered by **Shri Vasuki Iyengar,** Waste Management Specialist, Soil & Health Solutions, Bengaluru on 26th February, 2019. Eco-friendly cloth bags were distributed to all employees of Southern Region to promote no-use of plastic bags.

A picnic for officers and staff of Eastern Region along with their families was organised at Tumung, East Singhbhum district, Jharkhand on 9th February, 2019.

Fire Service Week was organised at Northeastern Region, during 14-20 April, 2019 with the theme "Fire Prevention is better than Fire Fighting". A deliberation on fire safety was given by Security Officer, NER followed by demonstration and exercise about fire safety and uses of fire extinguisher in various types of fire.

A Radon Geo Station has been installed at AMD Complex, Western Region, Jaipur. **Dr. N.S. Rawat** and **Shri M.S. Pathan**, senior Scientific Officers from BARC, Mumbai carried out the installation during 17-21 September, 2019.

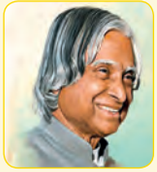
Officers and staff of National Disaster Response Force (NDRF), Maharashtra, Nagpur visited office and laboratories of Central Region, Nagpur. Lectures on activities of AMD and radiation hazards were delivered.

25 students and teachers of Raipur Engineering College, Raipur Chhattisgarh and 150 students and teachers of Navodaya Vidyalaya of Gujarat, Maharashtra and Goa visited Central Region office and laboratories on 18th October, 2019 and 18th November, 2019 respectively. They interacted with the scientists of Physics and Chemistry laboratories and working model of nuclear reactor was also shown to them.

The administration and accounts wing of AMD conducted "Pension Adalat" in Headquarters, Hyderabad on 23rd August, 2019 for the benefit of pensioners.

Shri K.N. Vyas, Chairman Atomic Energy Commission and Secretary, Department of Atomic Energy inaugurated the newly constructed Block-C and Nilgiri Auditorium in AMD Complex, Southern Region, Bengaluru.

A server room for EGDMS related activities was inaugurated in AMD Complex, Hyderabad on 27th June, 2019.



"Thinking is the capital, an enterprise is a way, and hard work is the solution."

— Abdul Kalam

दीक्षांत समारोह GRADUATION CEREMONY

Since its inception in 2009, the BARC Training School (BARCTS) - AMD Campus, Hyderabad is engaged in imparting specialised training on modern exploration methods in Geology and Geophysics disciplines. The

Graduation Ceremony of 9th batch of OCES-2018 of BARCTS, Hyderabad was held on 1st August, 2019. 17 Trainee Scientific Officers (13 in Geology and 4 in Geophysics disciplines) graduated on this occasion. **Dr. D. Singh**, Chairman and Managing Director, Indian Rare Earths India Limited was the Chief Guest at the function and awarded the graduation certificates to the officers and Homi Bhaba Medals to the toppers in Geology **(Shri Sachin Agarwal)** and Geophysics **(Shri Bibhu Prasad Das)** respectively. He also presented the M.Tech degree certificates to 12 officers of OCES-2016 batch.

Dr. D. Singh, in his convocation address stressed upon the responsibilities to be shouldered by young officers to fulfil the energy needs of the country. He also welcomed new TSOs of OCES-2019 (10th batch)

consisting of 10 TSOs in Geology and 2 in Geophysics disciplines. On this occasion, a booklet pertaining to the important activities of the BARC Training School-AMD Campus was distributed among the dignitaries, TSOs and audience.

निष्पन्नताएँ ACCOMPLISHMENTS

Shri Sukanta Goswami, Scientific Officer-E, Southern Region has been awarded PhD degree in Geology by Indian Institute of Technology (Indian School of Mines), Dhanbad for his research work titled “Lithofacies and origin of felsic volcanoclastic rocks of the Palaeoproterozoic Tadpatri Formation, Cuddapah Basin, Southern India”. Congratulations !

अंतर्राष्ट्रीय महिला दिवस समारोह INTERNATIONAL WOMEN’S DAY CELEBRATIONS

International Women’s Day was celebrated in Headquarters and Regional Centres on 8th March, 2019. In Eastern Region a panel discussion on the theme “Think equal, build smart, innovate for change” was organised for the women employees and ladies of employees’ families.

खेलकूद SPORTS

Shri Vedbrat, SO/C and **Shri Amit Singh Negi**, WA/A, Western Region, Jaipur represented PUSHKAR Hockey Team for XXXIV Annual DAE Sports Meet 2018 held in RR Site, NPCIL, Rawatbhata during 3-11 January, 2019. The PUSHKAR team won the trophy of XXXIV Inter DAE Hockey Meet.

Shri Rustum Ali, WA/A, Mineralogy-Petrology-Geochemistry Group, Hyderabad represented AMD as member of Golkonda Group and secured 3rd position in the 100m sprint and Shotput events in the XXXV Annual DAE Sports and Cultural Meet -2019 held at BARC, Mumbai during 20-22 December, 2019.

Shri Dipayan Saha, Scientific Officer/C, Exploration Geophysics Group, Hyderabad represented DAE in AIIIBT (All India Inter Institute Badminton Tournament) held during 10 - 13 September, 2019 in Guwahati and his double's team went upto quarter finals in the event.

Shri N. Murali, Assistant Accountant, Accounts Section and **Shri S. Siva Prasad**, PMSG, Hyderabad represented Golconda Group in XXXIV DAE Sports and Cultural Meet - 2019 held during 6 - 12 January, 2019 at RRCAT, Indore and emerged as runner-up in the Table Tennis Team Championship.

कार्यस्थल पर सुरक्षा SAFETY AT WORK PLACE

A demonstration on "Safety at work place" was conducted on 19th September, 2019 at Eastern Region, Jamshedpur by M/s Eastern Trading, Jamshedpur, an organisation having expertise in industrial safety. A demonstration on the use of safety tools at work place was also organised in Camp Narwapahar.

प्रतिनियुक्तियाँ DEPUTATIONS

Shri M.B. Verma, the then Director, AMD and **Shri B. Saravanan,** Additional Director (R&D) attended the International Conference on **"Prospectors and Developers Association of Canada, PDAC-2019"** held in Toronto, Canada during 3 – 6 March, 2019.

Shri M.B.Verma, the then Director, AMD visited Argentina, Chile and Bolivia during 10-19 October, 2019 as a member of the team led by **Dr. V.K. Saraswat,** NITI Aayog, to discuss on **"Rare Earths and Mineral Development Co-operation"**.

Shri M.B. Verma, the then Director, AMD, **Shri Mayank Agarwal,** Scientific Officer-H, Eastern Region and **Shri A.R. Mukundhan,** Scientific Officer-G, PMSG, Hyderabad attended the **"International Mining and Resources Conference and Expo-IMARC 2019"** held in Melbourne, Australia during 28-31 October, 2019.

नई भर्तियाँ NEW RECRUITMENTS

वर्ष 2019 के दौरान नए भर्ती/कार्यभार ग्रहण किए निम्नलिखित पदाधिकारियों का पखनि में स्वागत है. उनके वृत्ति-विकास के लिए शुभकामनाएँ

Name (Shri/Smt./Ms.)	Designation
Abhijith V	SO C
Ankur Kumar	SO C
Avichal Agarwal	SO C
Ayush Srivastava	SO C
Bibhu Prasad Das	SO C
Chinnamilli Ramanjaneyulu	SO C
Dommati Jalander	SO C
Manoj Kumar Routray	SO C
Monu Kumar	SO C
Pranav Raj Tyagi	SO C
Rachana Phulera	SO C

Name (Shri/Smt./Ms.)	Designation
Rohit Kumar Saini	SO C
Sachin Aggarwal	SO C
Sagar Kumar	SO C
Sanjeeb Kumar Dehingia	SO C
Subhajit Pandey	SO C
Vinoy Arockiadas Dsouza	SO C
Anil Kumar Sahoo	SA B
Diwa Shankar Mishra	SA B
Amit Dawar	ASO (A)
Athawale Sudhan Nagnath	Technician B
Prahalad Ram	Technician B

Name (Shri/Smt./Ms.)	Designation
Sourav Singh	Technician B
Ravinder Girish	UDC
Smt. Sneha Padmanabhan	UDC
Vinod Kumar Yadav	UDC
Bonakala Polaiah	Work Asst A
Neeluru Sivasankar	Work Asst A
Paramananda Behra	Work Asst A
Yelamanchali Aruna	Work Asst A
Sadanand Tiwari	Security Guard

सेवानिवृत्ति SUPERANNUATION

Name (Dr./Shri/Smt/Ms)	Designation
Verma M B	Outstanding Scientist
Ramesh Kumar K	SO H+
Anand A B	SO H
Brundaban Mishra	SO H
Murugan C	SO H
Prakash Chandra Pant	SO H
Pravin Kumar Sharma	SO H
Srinivas K	SO H
Jain R B	SO G
Rajiv Vimal	SO G
Ramesh Rao K	SO G
Ramror Timothy	SO G
Satyendra Kumar	SO G
Singh S B	SO G
Chatterjee T K	SO F
Gupta V K	SO F
Jegannathan G	SO F
Nautiyal D P	SO F
Raghunadh A V	SO F
Ramakrishna Prasad A	SO F
Raman Saini	SO F
Venkateswara Rao K	SO F
Chauhan D S	SO E
Pratap P D M	SO E
Raghu N	SO E
Srinivasa Rao M	SO E
Bhaskara Prasad M	JC(F&A)
Asha Raina	SO D
Lalithambal R	SA G
Nani Gopal Deb	Tech Sup. B (Drg)
Aloke Kumar Pal	SR Technician J
Kishore Babu S	SR Technician J
Om Prakash Singh	SR Technician J
Rajendran P K	SR Technician J
Ram Swroop V	SR Technician J
Ratna Swamy D	SR Technician J
Ajit Singh	SR Technician H
Borkar D G	SR Technician H
Braham Dass	SR Technician H
Ganesh Shanker Thaker	SR Technician H
Kawal Sai	SR Technician H
Khushi Ram	SR Technician H
Mohd Khalid	SR Technician H

Name (Dr./Shri/Smt/Ms)	Designation
Puran Nath Goswami	SR Technician H
R K Tembhurkar	SR Technician H
Raghunath	SR Technician H
Rajesh Kumar Sadyal	SR Technician H
Ram Narayan	SR Technician H
Singh M P	SR Technician H
Sonny M J	SR Technician H
Sudheendran P R	SR Technician H
Baljeet Kumar	Technician G
Bharat Lal Sahu	Technician G
Chatry N K	Technician G
Chopde V B	Technician G
Kamal Singh	Technician G
Patil D S	Technician G
Poovappa Gowda	Technician G
Balakrishna B	Technician F
Bishan Singh	Technician F
Horshi Kesheo	Technician F
Nand Kumar Singh	Technician F
Ramesh Chand	Technician F
Surai Bhumij	Technician F
Hiraman Lal	Technician D
Nipol Ch Sangma	Technician D
Narayan Ram	Technician C
Rupendra Sawarkar	Pvt. Secy. (Ns)
Mehar Singh	Asst Acctt
Kalyani Prasad	Steno Gr I
Venkatesh G	Steno Gr I
Aruna Badarinath	Senior Clerk
Ashok Kumar	UDC
Mintu Roy	Driver(Spl Grd)
Rajput R K	Driver(Spl Grd)
Dey D K	Driver Gr I
Dhurve P R	Driver Gr I
Emanual Syiem	Driver Gr I
Jiban Krishna Jena	Driver Gr I
Nagrare D S	Driver Gr I
Parimalendu Biswas	Driver Gr I
Ramu Hansda	Driver Gr I
Show Reddy A	Driver Gr I
Surjit Singh	Driver Gr I
Chhuturam Mahato	Work Asst C
Dnyaneshwar Bhiwaji Gajbhiye	Work Asst C

Name (Dr./Shri/Smt/Ms)	Designation
Ganesh B Uikey	Work Asst C
Jainand Singh	Work Asst C
Nageswara Rao M	Work Asst C
Ningamma	Work Asst C
Pramod Singh	Work Asst C
Shital Prasad Govinda Bagade	Work Asst C
Shriram D Dehariya	Work Asst C
Asha H Kharbikar	Work Asst B
Chetan Ram	Work Asst B
Duryodhan Pradhan	Work Asst B
Rama Gangi Reddy M	Work Asst B
Hanumantha Rao G	Sr Work Asst A
Sugia Devi	Sr Work Asst A
Biswanath Das	Head Sec. Guard
Inderdev Rai	Head Sec. Guard
Biswanath Das	Sr Sec. Guard
Paltan Ram	Sr Sec. Guard
Phool Sai	Sr Sec. Guard
Ramesh Chand	Sr Sec. Guard
Balak Bedia	Sr Sec. Guard
Baleshwar Majhi	Security Guard
Bhagwat Prasad Yadav	Security Guard
Bisru Ram Halba	Security Guard
Devapa Jatti Naik	Security Guard
Dinesh Chandra Tudu	Security Guard
Pravash Patra	Sr Sec. Guard
Valaram Meena	Security Guard
Vinod P Raut	Security Guard

स्वैच्छिक सेवानिवृत्ति VOLUNTARY RETIREMENT

Indumathi B	Assistant
Anasuya P Rao	Senior Clerk
Lakshmi Sateesh A	Senior Clerk
Nirmala Devi S	Senior Clerk
Vinodini P S	Senior Clerk
Laxmaiah P	Bearer
S K Lohar	Head Sec. Guard
Srimly Tongwah	Work Asst B

मंगलमय सेवानिवृत जीवन की हार्दिक शुभकामनाएं

श्रद्धांजलि OBITUARY

Name (Dr./Shri/Smt/Ms)	Designation
Bikram Sandil	Security Guard
Roshan Lal	Technician F
Bhaskar Reddy Challa	Driver(Ord Grd)
Ramgopal Panwar	Technician D
Mohinder Singh	Technician F
Rajesh Tularamji Dodke	Driver Gr I
Burnabas	Security Guard

हम दिवंगत आत्मा की शांति के लिए प्रार्थना करते हैं

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Fax : 040-27762940, E-Mail : amdhyd@ap.nic.in, Web site : http://www.amd.gov.in
मुद्रण : कलाज्योति प्रोसेस प्राइवेट लिमिटेड, हैदराबाद - 500 020
(मात्र निजी परिचालन हेतु)