Republic Day

Sunday, January 26, 2025

Venue: DAE Secretariat

Address by

Dr. A. K. Mohanty

Secretary DAE & Chairman AEC

Dear Colleagues, Ladies & Gentlemen

Good Morning. I welcome you all for the celebration of the 76th Republic Day of India. It is a moment of pride and an occasion for reflection today, when we commemorate the adoption of our constitution on this day in 1950. Today, we also pay tributes to our visionaries like Dr. B. R. Ambedkar, who, along with countless others, crafted a document that not only governs but also inspires us. Our Constitution is not just a legal document but stands as a beacon of justice, liberty, equality and fraternity in shaping our collective efforts for nation-building. Incidentally, the month of January is also the month of the birth of two of our great leaders, Swami Vivekananda and Netaji Subhash Chandra Bose.

As we stand under the tricolour, let us pledge to uphold the values enshrined in our Constitution and commit ourselves to fostering unity- in- diversity, promoting peace, and ensuring that every citizen, irrespective of caste, creed or religion, enjoys the fruits of freedom and equality.

The theme of our celebration this year is ‘Swarnim Bharat – Virasat aur Vikas’, that is, “Golden India – Heritage and Progress”. It fills my heart

with great joy and pride today to recount the achievements of our department in the last one year.

For the Indian Nuclear Power Program, the year 2024 has been a year of action and achievements. Our achievements and initiatives have also got reflected in the new policy announcements by our government. These initiatives highlight India's resolve to address global climate change concerns and also validate the growing importance of nuclear energy for our energy security and net-zero targets. As you know, the regular budget for Financial Year 2024-25 has set the stage for partnering with private partners to work on an indigenous heavy water-based Bharat Small Reactor and also to pursue R&D for indigenous light water-based Bharat Small Modular Reactors and technologies for hydrogen generation using High Temperature Gas Cooled Reactors. In this direction, NPCIL has recently issued a Request for Proposal inviting Indian Industry to finance and build a Bharat Small Reactor, which will act as a captive power plant for Commercial & Industrial Sector and will be operated by NPCIL. I am confident that that it is going to be an exciting time for all of us who are associated with nuclear sector. We need to draw inspiration from our achievements, build up on the momentum and prepare ourselves to participate and contribute in a much larger and diverse way.

1. AMD through its sustained exploration efforts has augmented a total of 12,478 tonne in-situ uranium oxide resources during the last year in the states of Andhra Pradesh, Jharkhand and Rajasthan. While the total in-situ uranium oxide resource of the country has thus risen to 4 lakh 28 thousand 300 tonnes, our Beach Sand Mineral resources have been augmented to about 1,309 million tonnes containing 13.15 million tonnes Monazite.

2. During this period, 74,900 tonne in-situ Rare Earth Oxide has been augmented in hard rock terrains of Rajasthan and for the first time in the country, 1,800 tonne lithium oxide in G-2 category has been established from pegmatite (hard rock) terrain of Karnataka.
3. HWB continues to produce nuclear grade Heavy Water for meeting the annual make-up requirement for our PHWRs. This time, it has also supplied the initial inventory of heavy water for RAPS-7. Recently, a new facility for production of nuclear grade solvents at Tuticorin has started operation and is being used to supply these solvents to NFC, IGCAR and NRB. HWB has also continued the export of heavy water to USA, France, Japan, etc. for non-nuclear applications and has entered into an agreement with Argentina for supply of Heavy Water for its Nuclear Power Program.
4. In the series of newly built 700 MW PHWRs, KAPP-4 has started commercial production, RAPP 7 has attained First Criticality and PHT Hydro Test has been completed for RAPP 8.
5. NPCIL's fleet of operating reactors has cumulatively generated 48823 million Units of electricity in the last year and has achieved continuous operation of more than a year on 4 occasions. NPCIL has also achieved 629 reactor years of cumulative safe operation of all the units since start of their operation.
6. BARC has developed a system for detachment of the Calandria Tube from the rolled joint in 540 MWe (CTRJD-540) PHWR. This technology has been transferred to NPCIL for fabrication and deployment at TAPS 3 & 4 for replacement of calandria tubes.
7. NPCIL and NTPC have signed a supplementary Joint Venture agreement to develop nuclear power facilities in the country. The JV named ASHVINI will function within the existing legal framework of the Atomic Energy Act 1962 (amended in 2015) and will build, own, and

operate nuclear power plants, including the upcoming 4x700 MWe PHWR Mahi-Banswara Rajasthan Atomic Power Project. NPCIL has also signed an MoU with Emirates Nuclear Energy Corporation (ENEC), UAE for nuclear cooperation.

Coming to the Department's contribution towards societal application of radiation technology in the areas of Agriculture, Food Processing & Preservation, Water & Urban Waste Management etc., the same is gaining traction not only with industrial and rural licensees from private sector, but also from other departments/ ministries of Government. DAE societal technologies are getting transferred on a continuous basis, and in the last 10 years, a total of 218 technologies have been transferred to 849 licensees. The highlight of the last year is an Expression-of-Interest floated by Ministry of Food Processing Industries for 50 multi-product irradiation units based on DAE technology. These units are aimed at establishing an Integrated Cold Chain & Value Addition Infrastructure as part of the Pradhan Mantri Kisan Sampada Yojana.

1. BARC has developed and released 8 new crop varieties (5 cereals and 3 oilseeds) for commercial cultivation by the farmers.
2. 9 MoUs have been signed by BRIT for setting up gamma radiation processing facilities in private and state government sectors and 2 such facilities are in advanced stages of commissioning. A total of 35 such facilities are already operating in India and cater to the domestic and export requirements for healthcare product sterilization and hygienization of agro-products like mango, spices, onion and herbal products. BRIT is supporting these facilities by supplying Co-60 sources and establishing the plant operational parameters.

Towards Health Care, DAE continues to move undeterred in the areas of indigenous production & supply of radiopharmaceuticals and providing standardised affordable cancer care across the country. In this mission, TMC, BRIT, VECC, HWB, BARC and IGCAR continue to scale new heights and going ahead, the challenge remains to maintain & better our performance, year-on-year. In the year 2024, DAE units collectively made their presence felt in following ways.
their presence felt in following ways.

1. The National Cancer Grid, now a 362-member network across the country, spearheaded by Tata Memorial Centre, treats approximately 60 % of country's total cancer load. The NCG has supported the establishment of SEACanGrid - a network of countries / cancer centres in the WHO Southeast Asia region which is being coordinated by WHO South-East Asia Regional Office. The aim is to share best practices developed by the NCG with other South-East Asia Region countries to improve cancer control in Southeast Asia.
2. Under the ISHA project at TMC's Mahamana Pt. Madan Mohan Malaviya Cancer Centre, Varanasi, oral, breast and cervical cancer screening of approximately 1,35,000 rural and urban women in Varanasi district has been completed. The Department of Preventive Medicine has also conducted door to door counselling and awareness programmes for common cancers like oral, breast and cervical cancer in both rural & urban areas. More than 900 Accredited Social Health Activists along with Auxiliary Nurse Midwives and more than 1,60,000 persons from the general population have been educated about the harmful effects of tobacco and early detection of oral, breast and cervical cancer.

3. BARC has developed a rigidified diamide ligand, Oxabicyclo dicarboxamide (OBDA) for efficient separation of ^{90}Sr-^{90}Y from high level waste for treatment of liver cancer.
4. HWB has demonstrated technology for production of Deuterium Depleted Water on industrial scale and a facility for this has been made operational at HWP-Kota.

Now, I would like to touch upon our priority in Basic & Directed research in Science and Advanced Technologies which are contributing to the progress and development of our nation.

1. ECIL has developed Weapon Control System for Astra Missile VL-SRSAM. It is interfaced with the Multi-Functional Radar, Ship Data Link, Launcher, Missile and Ship Combat Management System (CMS) to evaluate the threat Situation scenario, plan resources, execute missile launches and carry out kill assessment.
2. ECIL has developed Indigenous Slotted Waveguide Multimode Radar Antenna for LCA TEJAS Fighters which is undergoing flight trials at Aeronautical Development Agency (ADA).
3. The 0.6Meter+ Airborne SATCOM Terminal – Extended Temperature (AST-ET), developed and delivered by ECIL in collaboration with BARC to DRDO's Defence Electronics Application Laboratory at Dehradun and is currently under testing at the customer site.
4. IPR has made progress in Fusion technology areas and has fabricated High Temperature Superconductor solenoid magnet using Rare-Earth Barium Copper Oxide tapes.
5. Regular utilization of beam tube neutron imaging facility has commenced at APSARA-U reactor in BARC and is being efficiently used for testing of detectors and for other research work.

6. BARC has successfully completed its first incubation in the Atal Incubation Centre and the incubatee has started marketing Caesium Iodide-Thallium single crystal based handheld Gamma Spectrometers. The Atal Incubation Centre of IGCAR called “AIC-IGCAR-FAST Foundation" has been registered as a Section-8 Company’ under Companies Act, 2013.
7. A Joint Venture Agreement has been signed by IREL with M/s UKTMP-JSC of Kazakhstan for setting up of Titanium Slag plant in India.
8. At BARC, Pixel type Radiation Detectors have been fabricated for the first time based by using indigenously grown high purity prime grade silicon wafers. These detectors were tested at TIFR and have met the technical requirements.
9. RRCAT has developed a portable Cold atom-based quantum sensor (Gravimeter) for high precision measurement of earth’s gravitational acceleration. Due to its portability, this device has potential for deployment in the field of exploration of minerals, oil and gas under the earth’s surface without drilling the earth.
10. NFC has developed Hastelloy (a Ni based alloy) Tubes for the first time for Indian Molten Salt Breeder Reactor test loop and has also successfully developed and indigenously manufactured Nickel & Copper alloy tubes called Monel 400 tubes for ISRO.
11. BRIT has designed and developed India’s first tungsten-shielded, Iridium-192-based industrial radiography device “(ROTEX-I)”, which is compact, lightweight and portable. The device will be useful in a broad spectrum of critical sectors, including chemical, energy, defence, nuclear, aerospace and especially, Non-Destructive Testing (NDT) industries, ensuring a wide-reaching impact on India’s technological and economic advancements. With reliable availability and better

serviceability, it serves as a potential import substitute and ensures that Indian industries have access to high-quality technologies under “Atma Nirbhar Bharat”.

12. TIFR has made significant breakthroughs in Advanced technologies, e.g. end-to-end testing of a 6-qubit superconducting quantum processor, development of Near Field Scanning Terahertz Microscope and has demonstrated a superconducting device using a high-temperature Bismuth Strontium Caclium Copper Oxide superconductor BSCCO which mimics the behaviour of a semiconductor diode. This development has the potential for the development of very low energy dissipating circuits using superconductors and can have applications in technologies such as quantum computing, ultra-high sensitivity detector circuits, etc.
13. IMSc continues to contribute in the areas of Computational Biology, Mathematics, Theoretical Physics, Theoretical Computer Science and has published 179 research papers in national and international publications last year. During the same period, CEBS faculty has published 55 research papers including peer reviewed journals, book chapters and books.
14. Institute of Physics, Bhubaneswar has been contributing significantly towards fundamental and applied research in Physics. More than 100 research publications in peer reviewed international journals have been published in last year in the fields of Nuclear Physics, High Energy Particle Physics, String Theory, Condensed Matter Physics Experiment and Theory, Biological Physics, Cosmology, Statistical Physics etc.
15. At SINP, India's first accelerator-based nuclear astrophysics centre, FRENA, has started producing first Physics results and the same have been published in an internationally reputed peer-reviewed journal.

Now, I will like to touch upon the concerted efforts which DAE is making towards Human Resources Development and Capacity Building and is the common thread for all our activities.

1. DAE hosted its inaugural Conclave at NISER Bhubaneswar in October, 2024, as a part of its Platinum Jubilee Celebration, to celebrate its scientific accomplishments and share its plan for the future. Several DAE technologies for the benefit of society, young researchers, industries and health care professionals were exhibited.
2. NIRF has ranked HBNI at 6th position in the Research Institution category, 16th position in the University category, and 27th position in Overall category in India. The Nature Index 2024 has placed HBNI in the first position regarding publications in Physical Sciences and in the second position for overall publications among all institutions in India.
3. During the last year, TIFR awarded 133 Ph. D and 98 M. Sc degrees.
4. Mahamana Pandit Madan Mohan Malviya Cancer Centre & Homi Bhabha Cancer Hospital, Varanasi got affiliated to Homi Bhabha National Institute as its new Off-Campus Centre. With this HBNI has a total of 12 institutions under its fold comprising of two Off-Campus Centres and 10 Collaborating Institutes.
5. HBNI has signed MoUs to share expertise in capacity building of mutual interest areas with Defence Institute of Technology (DIAT), Pune, Indian Institute of Technology, Delhi (IITD), Confederation of Indian Industry (CII), Mumbai and Indian Institute of Technology, Jammu.
6. Indian Students have performed exceedingly well at the International Olympiads. India has secured a total of 10 gold, 15 Silver and 3

Bronze Medals at various Olympiads for Mathematics, Biology, Physics, Chemistry and Astronomy and Astrophysics.

While we continue to strengthen our focus in our mandated areas, our Service Organizations like DCSEM, DPS and GSO have continued to support, facilitate and augment the Department's infrastructure. DPS is bringing many important changes in procurement and stores for improving the proficiency, uniformity and speed in procurement cycle. A common Material Management System has been implemented in AERB, DCSEM and BRIT in Mumbai and implementation in HWB is in progress. DCSEM has completed major construction of GCNEP Phase II project at Bahadurgarh.

As you can see that the collective efforts of DAE have yielded significant achievements in various fields. It is not surprising that quite a few National & International accolades have been bestowed upon the DAE fraternity. I would like to share my joy with you for these recognitions.

1. AMD has been conferred with Excellence Award in the category for 'Best Heavy Mineral Exploration of the Year' by Rare Earths Association of India (REAI) and Indian School of Mines Alumni Association (ISMAA), Kolkata Chapter in the forum of International Conference on Heavy Minerals and Lithium for Energy Security.
2. ECIL has been awarded the IETE Corporate Award for Performance in Electronic Instruments and Instrumentation for the year 2024 at the 67th Annual IETE Convention held in Bhopal. This accolade acknowledges ECIL's contributions to the nation's self-reliance in this vital sector.

3. At NISER, Prof. C. Gunanathan from the School of Chemical Sciences and Dr. Manas Ranjan Sahoo from the School of Mathematical Sciences have been awarded the INSA Associate Fellowship for 2024 while Dr. Sayantani Bhattacharya from the School of Physical Sciences has been awarded the INSA Young Associate 2024.

While our scientists, technologists and engineers continue their effort to deliver their best, our children studying in the AEES schools have also been making us proud.

1. 6 Exhibits from our AEES schools were selected for participation in the 51st Rashtriya Bal Vaigyanik Pradarshani 2024 by NCERT.
2. 12 students from Atomic Energy Central Schools achieved a rank within top 100 in the Arybhata Ganit Challenge.

Dear Colleagues,

Over the last 7 decades, we have built capabilities in all spheres of nuclear energy. It is now time for us to consolidate our wide-ranging nation-centric activities and re-organise them into more focused & action-oriented mandates. Towards this, our department has released a vision document for 2047 which will contribute to the national vision of Viksit Bharat.

I would like to thank you for all your efforts and urge all of you that as citizens of this great country and partners in the successes of our department, it is our duty to support these advancements and ensure that they are used responsibly for the benefit of humanity. Together, let us work to build an India that is not only self-reliant but also a beacon of hope and innovation for the world. Let the tricolour remind us of our potential

and our shared commitment to progress. May our achievements in science and technology inspire us to dream bigger and reach higher and so that we can stand up to our national aspiration of Viksit Bharat.

I would like to specifically mention and sincerely acknowledge the dedication of our health care professionals, security professionals and administrative/ technical/ scientific staff who play a very important role in ensuring the safety, security and good health of all our employees and their families and thus create a positive work environment for all of us.

In the end, I would like to extend my good wishes to all members of DAE and their families.

Thank you very much and Jai Hind.