



# Industry

## BARC's Nuclear

The spinoff technologies developed through research and development in nuclear energy at BARC are regularly transferred to industry for commercialization. BARC provides comprehensive support to licensees by offering technology training, field demonstrations, consultancy, and detailed documentation that includes procedures, flowcharts, diagrams, troubleshooting guides, and lists of raw materials, equipment, and suppliers. During the period from September to October 2024, BARC transferred five technologies to various industries.

By TT&CD and SIRD Newsletter Editorial Team

### Technology Transfers

**B**ARC has transferred the technology of Atmospheric pressure portable catalytic air plasma system for fast synthesis of aqueous Nitrate & Nitrite fertilizers to M/s. Nano Fertilizers Pvt. Ltd., Delhi. It also transferred the technology of Radiation Assisted Adsorbent for Textile Effluent Decolouration (Rad-TED) to M/s. Synco Industries Ltd., Jodhpur.

Other key technologies transferred to industry include;

**A Rapid Composting Technology for decomposition of dry leaves, kitchen waste and temple waste:** Transferred to M/s. Swayambhar Producer Company Limited, West Bengal.

**NISARGRUNA Biogas Plant for Processing Biodegradable Waste:** Transferred to M/s. Watech Greepo Systems Pvt. Ltd., Lucknow, Uttar Pradesh.

**Pulsed UV Disinfection System:** Transferred to M/s. Faith Innovations, Delhi.

Besides, **the license period of BARC's AnuSpect Gamma Spectrum Analysis Software (Source Code and Binary Version) technology** for M/s. Nucleonix Systems Pvt. Ltd., Hyderabad has been renewed. This is the first renewal to the firm; **Fluoride Detection Kit for Ground Water has been** renewed to M/s. Orlab Instruments Pvt. Ltd. Hyderabad. This is the third renewal for the firm.

**Technology Overview:** Nitrate and nitrites are essential nutrients for the crops. The present invention offers a portable thermal plasma device for fast synthesis of nitrate and nitrite in high concentration, via a catalyst based green process leaving zero carbon footprints. A highly reactive thermal plasma environment facilitates the synthesis process at a power level of 20 kW at atmospheric pressure, does not use any additional chemical, and directly converts atmospheric air into nitrate and nitrite through interaction with water in a very efficient and controlled manner. This system offers a clean, sustainable, decentralized, flexible alternative method for generation of nitrates and nitrites that may be used as nitrogen-based crop fertilizer. Achieved concentration is several orders of magnitude higher than that achievable in competing non-thermal plasma processes.

**Technology Overview:** The indiscriminate release of coloured dye wastewater from cotton/viscose textile industries into water streams not only spoils aesthetics but also affects the ground water quality adversely, posing serious health risks to diverse forms of life. Strict environmental norms have pushed these industries to the brink of shutdown owing to non-compliance. Therefore, non-expensive, environment-friendly viable technologies are the need of hour to mitigate this ever-escalating problem, particularly for small and unorganized industries with limited financial resources. 'Radiation assisted Adsorbent technology for Textile Effluent Decolouration (RAD-TED)', developed by BARC, aids in removal of anionic dyes from cotton/viscose textile dyeing/printing wastewater streams. The technology offers a simple, efficient and cost-effective solution to decolorize and recycle cotton/viscose textile wastewater.

# beckons



## Spin-off technologies



Signing of MoU for Utilization of Neutron Imaging Facility at BARC for Archaeometric Analysis..

### Memorandum of Understanding

A MoU titled Utilization of Neutron Imaging Facility at BARC for Archaeometric Analysis: Signed on 02/09/24 for 3-year period between BARC, Directorate of Archaeology and Museums, Mumbai, Maharashtra. The MoU explores the potential of neutron-based non-destructive techniques set up at the Dhruva and APSARA-U nuclear research reactors by Technical Physics Division of Physics Group, BARC in characterizing archaeological artefacts. The technique, because of its large penetration depth aims at deciphering the internal morphology, providing the conservation scientists with deep insight into the craft ship and manufacturing practices of our ancestors.

### AKRUTI

For Phase-II activities at AKRUTI Kendra in Tarapur, a tripartite MoU was inked by NPCIL, BARC and SVERI on 27/09/24 in Tarapur. Signing of Tripartite MoU between SVERI, Pandharpur, NPCIL and BARC at AKRUTI Kendra - Tarapur for Phase-II activities.

### Activities of AKRUTI:

A tripartite Memorandum of Understanding (MoU) was signed among NPCIL, BARC, and SVERI to advance Phase-II activities at the AKRUTI Kendra located in Tarapur. This facility is dedicated to fostering entrepreneurship development specifically targeted at rural households. The initiative aims to positively impact approximately 5,000 students and 25,000 farmers, among other beneficiaries.

The existing MoU for Phase-I focused on enhancing community awareness through the display

and demonstration of DAE-BARC technologies for residents near NPCIL's Tarapur Atomic Power Station (TAPS).

In addition to these developments, the BARC AKRUTI Team has actively engaged with various educational institutions across India over the past quarter to promote and popularize DAE technologies among students.

Notable institutions involved in this outreach include Jaihind College in Mumbai, Savitribai Phule Pune University, Dr. D. Y. Patil Arts, Commerce and Science College in Pune, Mahatma Gandhi University in Kottayam, Kerala, and Uttar Banga Krishi Vishwavidyalaya in Cooch Behar, West Bengal.

This comprehensive approach not only aims to equip students with knowledge about advanced societal technologies of DAE but also seeks to bridge the gap between academia and practical applications in rural entrepreneurship, thereby fostering a sustainable ecosystem for innovation and growth within these communities.

### Atal Incubation Centre-BARC

AIC-BARC and HBNI jointly announced the second cohort of the Start-up Pre-Incubation Program for aspiring young innovators, early-stage entrepreneurs, and students. Eligible STEM and non-technical students can form teams to jointly develop a start-up idea. The program will run between November 2024 and early February 2025 with six weeks of online sessions in between, aimed at boosting ideas to make the first prototype.



Signing of Tripartite MoU between SVERI, Pandharpur, NPCIL and BARC at AKRUTI Kendra - Tarapur for Phase-II activities.